DOCUMENT RESUME

ED 308 069	SE 050 616

AUTHOR	Al-Shahrani, Amer A. S.
TITLE	An Analysis of Variables Related to Biology Achievement at the 12th Grade Level in the Southwestern Region of Saudi Arabia.
PUB DATE	89
NOTE	357p.; Ph.D. Dissertation, The Ohio State University. Some of the appendix is in both English and Arabic.
PUB TYPE	Dissertations/Theses - Doctoral Dissertations (041) -- Reports - Research/Technical (143)
EDRS PRICE	MF01/PC15 Plus Postage.
DESCRIPTORS	*Biology; Educational Research; *Foreign Countries; School Effectiveness; *Science Instruction; Science Teachers; Secondary Education; *Secondary School Science; *Student Characteristics; Student Interests; Student Needs; *Teacher Characteristics
IDENTIFIERS	*Saudi Arabia

ABSTRACT

Saudi Arabia has not ignored the fact that education is the key to a nation's progress. It considers education as a first priority and is trying to catch up with more advanced nations in this area. One way Saudi Arabia has planned to reduce the risk of complete reliance on the oil revenues is by improving education. This study was designed to identify ways to improve biology education. The three purposes were to determine: (1) major characteristics of science students, schools, and biology programs in the southwestern region of Saudi Arabia; (2) relationships among student and teacher characteristics, school variables, and biology achievement; and (3) identify and describe the major problems that relate to science teaching and achievement as perceived by science teachers and students. Some conclusions were that: the national science curriculum needs to be improved; parental and student variables related to student achievement; and school variables related to student achievement. This document includes an introduction; review of literature; methods and procedures; results; summary, conclusions, and recommendations; and appendices. (RT)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED308069

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Amer A S Al-Shahrani

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☒ This document has been reproduced as received from the person or organization originating it
☐ Minor changes have been made to improve reproduction quality

- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

An Analysis of Variables Related to Biology Achievement at the 12th Grade Level in the Southwestern Region of Saudi Arabia

DISSERTATION

Presented in Partial Fulfillment of the Requirments for
the Degree of Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Amer A. S. Al-Shahrani, B.S., M.A.

* * * * *

The Ohio State University

1989

Dissertation Committee:
Dr. Robert W. Howe
Dr. Patricia E. Blosser
Dr. John F. Disinger

Approved by

Robert W. Howe

Dr. Robert W. Howe, Adviser
College of Education

SE 050 616

BEST COPY AVAILABLE

IN THE NAME OF ALLAH

THE MERCIFUL THE COMPASSIONATE

DEDICATION

To My Parents,
My Wife and my Children
My Teachers and Friends

ACKNOWLEDGMENTS

With out assistance, cooperation, encouragment, and support of many individuals, this dissertation would have never been completed. The researcher's deep appreciation can not be measured adequately by these acknowledgments.

My special thanks go to Dr. Robert W. Howe, my major advisor and dissertation committee chairman, for his wise counsel, patience, and kind words for encouragment. I especially appreciate the confidence he has always expressed in my abilities and his flexibility in allowing me to carve my own path.

My deep gratitude goes also to Dr. Patricia E. Blosser not only for her advice and guidance she provided but also for being so helpful when difficulties encountered.

I wish to thank Dr. John F. Disinger for his continuing interest in and assistance with this study.

The author will be gratful forever to the students and teachers who participated in this study. I am also grateful to all those who have provided assistance during the process of collecting data in Saudi Arabia. I wish to thank CTB/Mcgraw-Hill, Publisher's test service for allowing me to translate and use the California Achievement Test (Mathematics)

Most of all, gratitudes are due to my family: My father Abdullah and my mother Ghalba whose love and support have sustained me, I express my deepest appreciation; my brother Saeed and his family, Mohammed and his fiancee, and all my sisters who encouraged and supported me during the time I was a way from them.

Finally, to my wife Salma M. Joman, my sons Abdullah, and Ahid go my love and gratitudes for their patience, understanding, support, and care they showed during the time of my stay in the United States.

VITA

June 8, 1958	Born -- Khamise Mushaite, Saudi Arabia
1977 - 1981	College of Education, King Saud University, Abha Branch
1981	B.Sc. in Biology and Education
1981 -1982	Teaching Assistant in both Biology and Curriculum & Instruction Departments
1983 - 1985	Graduate Student at The Ohio State University
1985	M.A., Faculty of Science & Mathematics Education, The Ohio State University, Columbus, Ohio.
1986 - 1989	Ph.D. Student at The Ohio State University

FIELDS OF STUDY

Major Field: Science Education

Science Education	Professor Robert W. Howe Professor Patricia E. Blosser
Educational Research	Professor Robert W. Howe Professor Arthur L. White
Teacher Education	Professor Robert W. Howe Professor Patricia E. Blosser
Environmental Science	Professor John F. Disinger

TABLE OF CONTENTS

PAGE

DEDICATION ii

ACKNOWLEDGEMENTS iii

VITA v

LIST OF TABLES x

LIST OF FIGURES xiv

CHAPTER

I INTRODUCTION 1

Background of the Study........................ 1
Need for the Study 4
Statement of the Purpose 6
Model for the Study --Presenting Significant Predictors of Biology Achievement 7
Statement of the Problem 11
Assumptions 13
Delimitations 14
Limitations 15
Definition of Terms 15
Hypotheses 19
Summary 22

II EDUCATION SYSTEM IN SAUDI ARABIA AND REVIEW OF LITERATURE

DEVELOPMENT OF EDUCATION IN SAUDI ARABIA 23
THE STRUCTURE OF THE SCHOOL SYSTEM IN SAUDI ARABIA 27

Elementary Education 30
Intermediate Education 30
Secondary Education 31
Higher Education 33
Proportion of Male Saudi Staff in Teaching Positions in Pre-college 34

REVIEW OF RELATED LITERATURE 34

Section One: Student Characteristics .. 34
Section Two: Teacher Characteristics .. 49
Section Three: School Variables 62

III METHODS AND PROCEDURES 75

Section One: Introduction 75
Section Two: Population and Samples ... 75
Section Three: Instruments Used in Assessment 79
Section Four: Data Collection 95
Section Five: Data Analysis 97
Summary 101

IV RESULTS 102

Section One: Sample Characteristics ... 102
Section Two: Correlations between Variables 120
Section Three: Results of Analysis of Variance for Differences in Schools Achievement on the Biology Test 121
Section Four: Results of Stepwise Multiple Regression Analysis 121
Section Five: Analysis of Covariance Using Specific Student Covariates 131
Section Six: Testing of Hypotheses 137
Summary 141

V SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Study 142
Summary of Findings 144
Conclusions 148
Recommendations 156

APPENDICES

A. The Al-Shahrani Biology Achievement Test (ABAT) -- English Version 166

B. The Al-Shahrani Biology Achievement Test (ABAT) -- Arabic Version. A Translation of the English Version .. 182

C. Student's Background Information Questionnaire -- English Version 200

D. Student's Background Information Questionnaire -- Arabic Version. A Translation of the English Version .. 203

E. Teacher's Background Information Questionnaire -- English Version 206

F. Teacher's Background Information Questionnaire -- Arabic Version. A Translation of the English Version .. 209

G. A Copy of the Permission Letter to Translate and Use The California Achievement Test in Mathematics (CAT/C book 19) 212

H. Check List for Assessment of Science Teacher: Pupil's Perceptions (CAST:PP) English Version 213

I. Check List for Assessment of Science Teacher: Pupil's Perceptions (CAST:PP) Arabic Version. A Translation of the English Version 221

J. Science Classroom Activity Checklist: Teacher's Perceptions (SCACL:TP) English Version 228

K. Science Classroom Activity Checklist SCACL: Teacher's Perceptions (SCACL:TP) Arabic Version. A Translation of the English Version 234

L. School Information Questionnaire English Version 239

M. School Information Questionnaire Arabic Vrsion. A Translation of the English Version 240

N. Categories and Codings of all Variables 241

O. Correlation Matrices of all Variables 245

P. Frequencies and Means for Selected Variables that Did not Appear in the Regression 325

BIBLIOGRAPHY 327

LIST OF TABLES

Table Page

1. Number of Science Classes per Week in Secondary Schools in Saudi Arabia 26

2. The Enrollment of Students at the Intermediate Level in Saudi Arabia in 1965, 1975, 1985, and 1988 31

3. Growth of Enrollment in Grade 11th and 12th (Science and Art Divisions) in Secondary Schools in Saudi Arabia 33

4. Number of Male Secondary Schools and Enrollment in all Educational Districts in the Southwestern Region of Saudi Arabia 76

5. Educational Districts and Male Secondary Schools Included in the Study 79

6. Characteristics of Al-Shahrani Biology Achievement Test (ABAT) on the Pilot 82

7. Characteristics of Al-Shahrani Biology Achievement Test (ABAT) on the Final Version 83

8. An Analysis of Saudi Arabian Biology Textbooks (10th, 11th, and 12th grades) by Number of Pages Included for Each Topic ... 84

9. Number of Items by Topics and Bloom's Taxonomy for the ABAT 86

10. Percent Correct Responses by Topic and Bloom's Taxonomy for the ABAT 87

11. Percent Successful Responses by Topic and Grade Level for the ABAT 88

12. Characteristics of the Translated Mathematics Achievement Test (book 19C) ... 91

13. Frequency Distribution of Students by Age.. 103

14. Frequencies of Students by Nationality 104

15. Frequency Distribution of Father's Education 105

16. Frequency Distribution of Mother's Education 105

17. Frequencies of Father's Occupation 107

18. Frequency Distribution of Students by Their Interest in Science Fields 108

19. Frequency Distribution of Students by the Number of Years in the Secondary Level 109

20. The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for all Districts 110

21. The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Abha Educational District 110

22. The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Al-Baha Educationa District 111

23. The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Bisha Educational District 111

24. The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Jizan Educational District 112

25. The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Najran Educational District 112

26. Frequency Distribution of Science Teachers by Age 113

27. Distribution of Science Teachers by Nationality 114

28. Frequency Distribution of Science Teachers by Degree 115

29. Frequencies of Science Teachers by Major 116

30. Frequency Distribution of Science Teachers by Year of Teaching Experiences 116

31. Frequencies of Schools by Educational Districts 117

32. Sample Distribution of Schools and Students by School Size 118

33. Frequency Distribution of Schools by Location 119

34. Number of Science Classes (11th and 12th grades) in all Sampled Secondary Schools .. 119

35. Distribution of Science Class Size in the Selected Schools 120

36. Analysis of Variance for Schools Differences on the Biology Test 123

37. Multiple Regression of Student Characteristics, School Variables, and Teacher Characteristics to Biology Achievement Without School ID's 125

38. Multiple Regression of General School Variables (SID's) to Biology Achievement 126

39. Multiple Regression of Student Characteristics, General School Variables (SID's), and Teacher Characteristics to Biology Achievement 130

40. Analysis of Covariance Adjusting for Mathematics 132

41. Analysis of Covariance Adjusting for Mathematics and Arabic Language (Grammar and Literature) 133

42. Analysis of Covariance Adjusting for Mathematics and Interest in Biology 134

43. Frequencies of Students by Their Responses in Considering Science Teaching as A Career 325

44. Average CAST Scores for 17 Schools 325

45. Average SCACL Scores for 53 Science Teachers 326

46. Frequencies and Means of Teacher's Opinion of Science Teaching Problems 326

LIST OF FIGURES

FIGURES PAGE

1. Geographical Regions and the Distribution of Educational Districts in the Southwestern Region of Saudi Arabia 5

2. General Model of Student's Characteristics, Teacher's Characteristics, School Variables and Their Relationships to Student Achievement in Biology 9

3. Education System in Saudi Arabia as of 1989 29

CHAPTER I

INTRODUCTION

BACKGROUND OF THE STUDY

Education is the key to a nation's progress. It prepares individuals to be good citizens and to strive for an ideal society. This concept has influenced many nations around the world to consider education as a first priority. Saudi Arabia, as one of these nations, has not ignored this fact and has tried its best to catch up with more advanced nations. The accomplishment and the improvement in education and other fields has taken place not only because there was a real determination from the government and the Saudi people, but because of the country's wealth which comes from oil exports.

The wealth from oil production has allowed the country to establish and carry out needed national development projects. Saudi Arabia has planned to reduce the risk of its complete reliance on the oil revenues as the main source of its wealth. The reduction of this risk is made by developing other natural resources, by using modern technology and industrialization, and by improving education.

As a result of its rapid development and progress, Saudi Arabia, like other developing nations, needs skilled and qualified manpower in areas such as scientific and technical fields. The general purpose of education is to eradicate illiteracy and to prepare scientifically and technologically literate persons who have the basic knowledge of facts, concepts, and abilities to apply science processes in daily life (Ministry of Planning, 1984). A second main objective of education is to train technicians, teachers, managers, and administrators needed to cope with the rapid development. The skilled personnel needed are prepared by secondary schools and higher educational institutions.

Branscomb (1981) states that universal science literacy could be defined as the ability of every citizen to understand and cope with the natural phenomena of daily life. Hurd (1970) states that scientifically literate persons are those who are broadly educated in science including its products, processes, philosophies, and effects on society.

Welch (1985) stated that literacy generally means that set of cognitive, affective, and behavioral outcomes needed for a person to live in the more technological world.

The 1982 National Science Teachers Association (NSTA) Position Statement reported that the scientifically literate person has a substantial knowledge base of facts, concepts, conceptual networks, and process skills which enable the individual to continue learning and thinking logically. Simpson and Anderson (1981) stated that the scientifically literate person is characterized as one with an understanding of interrelationships of science and society, of ethics that control scientists in their work, of the nature and basic concepts in science, of differences between science and technology, and interrelationships of science and the humanities.

One of the main roles of the secondary schools in Saudi Arabia is to provide students with the basic knowledge and skills which help them to enter the field of professional work or continue their education at colleges or universities in the country or abroad. The performance of these graduates in their professions is highly influenced by the quality of education they received at the secondary school level. Another role of secondary school education is to develop the student's scientific thinking, research and systematic abilities, and to help the student to make better use of reference resources (Ministry of Education, 1970).

NEED FOR THE STUDY

Formal education in Saudi Arabia is a recent phenomenon. Before 1926, education was conducted at The Katateeb Schools which were available for a very small segment of the population, generally the wealthy people, in the big cities such as Mekkah, Jeddah, Ryiadh, and Madinah. Formal education first started in 1926 with the establishment of the Elmi Institute (Al-Eshikh, 1972). In 1937, a school was established in Mekkah; the purpose of this school was to prepare students to study abroad at the university level.

In Saudi Arabia, there are 40 educational districts (Ministry of Education, 1988). Thirteen of these districts are located in the southwestern region (see figure 1, p 5). The education system in Saudi Arabia is a very strong centralized system. However, this system needs research to determine the

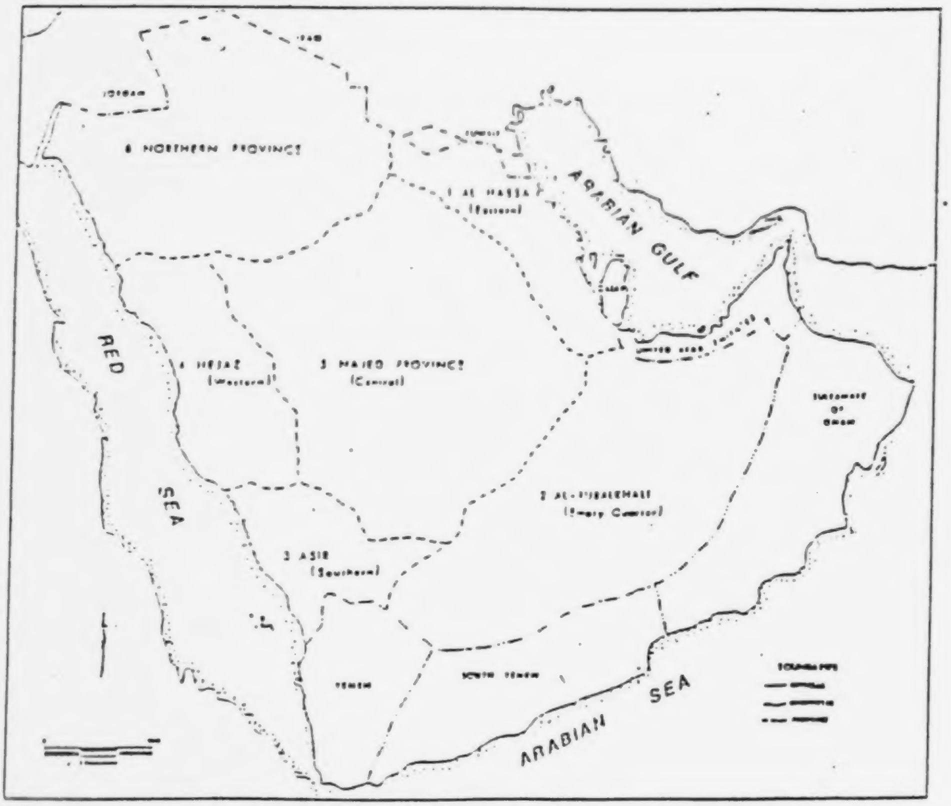

JORDAN
IRAQ
6 NORTHERN PROVINCE
KUWAIT
1 AL HASSA
(Eastern)
ARABIAN GULF
QATAR
UNITED ARAB EMIRATES
RED SEA
4 HEJAZ
(Western)
5 NAJED PROVINCE
(Central)
SULTANATE OF OMAN
(Empty Quarter)
3 ASIR
(Southern)
YEMEN
SOUTH YEMEN
BOUNDARIES
ARABIAN SEA

Figure 1. Geographical Regions and the Distribution of Educational Districts in the Southwestern Region of Saudi Arabia.

current status of education across different fields at all levels of schooling. At the secondary level, variables that are related to effective learning and teaching in science have not been identified and studied.

There is a need to determine the level of biology achievement and to identify (1) if schools differ in biology achievement at the 12th grade and (2) the variables that are significantly related to biology achievement in these schools.

The result of this study will be a useful resource for improving biology education in secondary schools and for improving preservice education programs for prospective science teachers.

STATEMENT OF THE PURPOSE

This study had three purposes. The first purpose of this study was to determine the major characteristics of science students, schools, and biology programs in the southwestern region of Saudi Arabia. The second purpose of this study was to determine the relationships among student and teacher characteristics, school variables, and biology achievement. More specifically, this study focused on the identification of variables for the prediction of student achievement in biology at the 12th grade. The third purpose of this study was to identify and describe the major problems that relate to science teaching and achievement in the public secondary schools as viewed by science teachers and science students in the southwestern region of Saudi Arabia.

MODEL FOR THE STUDY

Many variables influence student learning outcomes, including student characteristics, teacher characteristics, and school variables. The review of literature (Chapter 2) has shown that different variables such as students' characteristics, teachers' characteristics, and school variables have been strong predictors of science achievement. Brookover et al. (1979) developed a model of the school social system to present variables that have relations to the learning outcomes of the students. This model is based on research data that indicate student learning and achievement differ from one school to another. These differences are related to the student characteristics, quality of teachers, and the social structure of the school.

Literature reviews indicate that these variables account for about 60 to 70 percent of the overall variance related to science performance. Walberg (1981) identified four major variables which are related to science achievement and which account for almost all of the variance in school achievement. These variables include developmental level of the learner, the ability of the student, social environment, and home environment.

The multiple hypothesis of this study was that student and teacher characteristics and school variables are significantly related to the students' learning outcomes in biology. Figure 2 is a model that relates these variables schematically. This model provides some specific variables selected in the first step of the research. In addition, school codes were used to identify school differences to help determine if other school variables contributed to the student achievement in biology other than the specific school variables presented in the model.

The student-characteristics cluster included home background variables (parents' education and occupation), age, nationality, number of brothers and sisters and their college education, number of years in secondary school level, student interest in science fields, mathematics achievement, Arabic language achievement (grammar and literature),

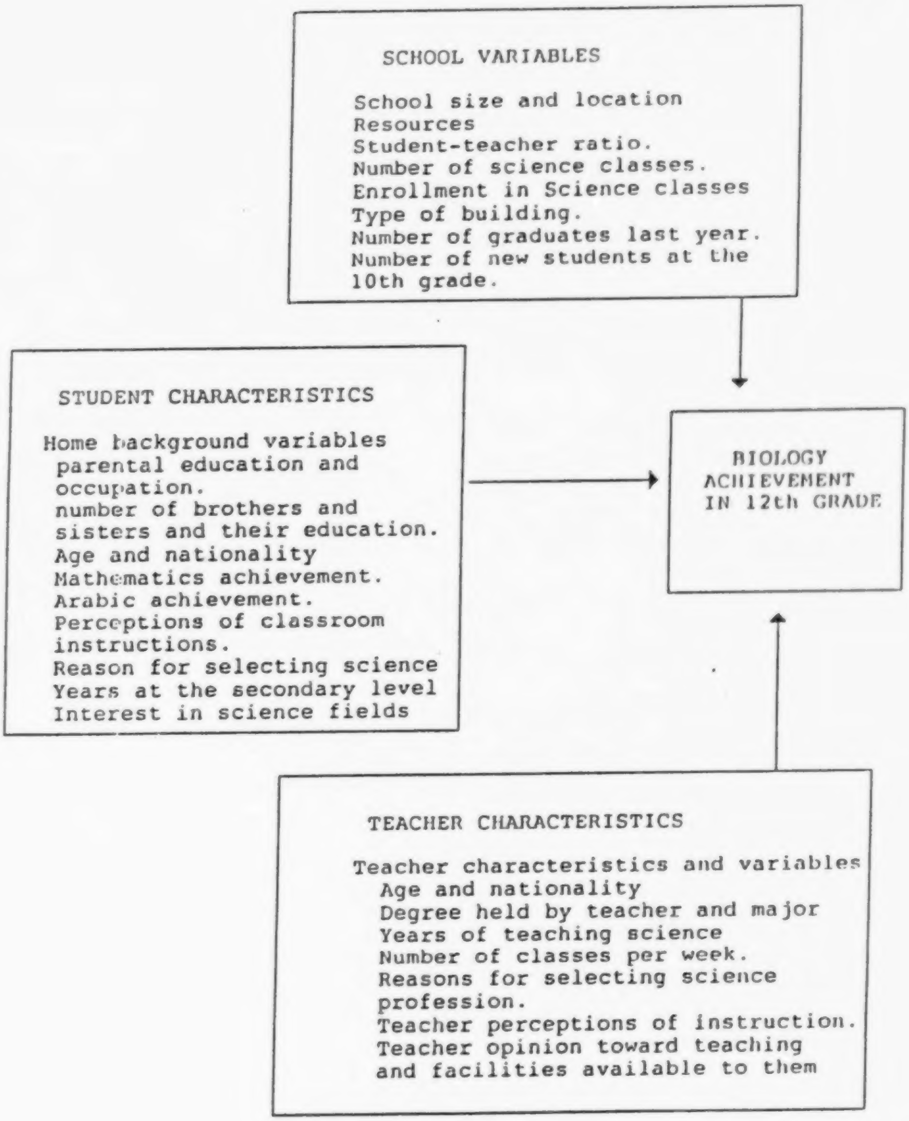

SCHOOL VARIABLES
School size and location
Resources
Student-teacher ratio.
Number of science classes.
Enrollment in Science classes
Type of building.
Number of graduates last year.
Number of new students at the 10th grade.
STUDENT CHARACTERISTICS
Home background variables
parental education and occupation.
number of brothers and sisters and their education.
Age and nationality
Mathematics achievement.
Arabic achievement.
Perceptions of classroom instructions.
Reason for selecting science
Years at the secondary level
Interest in science fields
BIOLOGY ACHIEVEMENT IN 12th GRADE
TEACHER CHARACTERISTICS
Teacher characteristics and variables
Age and nationality
Degree held by teacher and major
Years of teaching science
Number of classes per week.
Reasons for selecting science profession.
Teacher perceptions of instruction.
Teacher opinion toward teaching and facilities available to them

Figure 2. General Model of Student Characteristic, Teacher Characteristics, School Variables, and their Relationships to Student Achievement in Biology.

students' perceptions of classroom activities and student teacher relationships, reason for selecting science division, and biology achievement.

The teacher-characteristics cluster included age, experiences (number of years teaching science), degree, major, nationality, reason for selecting science teaching as a career, number of classes each week, nature of activity that a teacher uses in science classes, and facilities available in schools.

Included in the cluster of school variables were school size, location, student-teacher ratio, type of buildings, number of science classes, enrollment in science classes, and resources. The results of previous research studies support the impact of these clusters in science achievement. Also, the research data helped to identify which of these clusters and which of variables within each cluster were associated with science achievement.

Each group of variables will affect student learning and taken together will produce a joint effect. Blosser (1984) stated that different variables showed a significant correlation with achievement. Weiner (1974) indicated that the achievement process is not limited to a single variable, but it is a result of a combination and interaction of several variables. Lavin (1965) stated that the three factors emerge as the basic correlates of academic performance are learner ability, sex, and socio-economic status (SES). These factors are related more consistently to student performance.

STATEMENT OF THE PROBLEM

In the educational literature of Saudi Arabia, there has been a paucity of research on the investigation of current conditions and practices associated with science education. As a result, the gap between the training of science teachers and the use of modern science strategies has become greater. Thus, the need to study the present practices and problems is apparent.

The relationships among science student outcomes and school environments emerges from the growing concerns regarding better education programs for science teachers and an analysis of science practices in public schools. Therefore, the problem of this study was to investigate the following questions:

1. What are the student characteristics which are predictors of biology achievement?
   a. Home background variables:

        1) parental job and occupation.
        2) educational level.
        3) number of brothers and sisters and their education.
    b. Academic background
        1) Mathematics achievement.
        2) Arabic achievement (literature and grammar)
    c. Age and nationality.
    d. Reason for selecting science division.
    e. Number of years at the secondary level.
    f. Student perceptions of classroom instruction.
    g. Interest in science fields.

2. What are the teacher characteristics which are predictors of biology achievement?
    a. Age and nationality.
    b. Degree and major.
    c. Years teaching science.
    d. Reason for selecting teaching profession.
    e. Number of classes per week.
    f. Teacher perceptions of classroom instruction.
    g. Teacher opinion toward teaching, facilities, and equipment available to them.
3. What are the school difference variables which are predictors of biology achievement?
    a. School size.

   b. Location.
   c. Student-teacher ratio.
   d. Number of science classes and the class size.
   e. Type of building.
   f. Number of the graduates in the last year.
   g. Number of new students at 10th grade.
   h. Enrollment in science classes.
   i. Availability of materials, equipment, facilities, and time for instruction.

4. Do some specific schools account for a significant amount of the variance when other variables have all been analyzed?

ASSUMPTIONS

The following assumptions related to this study were recognized:

1. The country uses a national curriculum; therefore, it was assumed that all teachers at all levels in every school cover most of the same curriculum materials in their teaching.

2. The answers received on the questionnaires were deemed to be appropriate indications of the judgments of the participants.

3. The students selected to respond to the questionnaires provided an adequate sample and

represented the population of the day-time public secondary schools enrolling only males in the southwestern region of Saudi Arabia.

DELIMITATIONS

This study has the following delimitations:

1. The study was restricted to the day-time public secondary schools enrolling only males in the southwestern region of Saudi Arabia. These schools are supervised and controlled by the Ministry of Education and provide educational programs for boys only from tenth grade through twelfth grade.

2. The study included only educational districts that have secondary school enrollment of 1500 students or higher.

3. The study included only large and middle size schools. The very small schools were not included (student enrollment of 60 students or less).

4. The study was delimited to 17 public high schools selected from 5 educational districts. These districts had enrollments of 1,500 students or more at the secondary school level.

5. The study was delimited to the regular (traditional) secondary schools enrolling only males. Modern secondary schools were not included because

the number of these schools was very small and they were under development.

6. The study was delimited to the 12th grade science division in the selected schools.

LIMITATIONS

This study has the following limitations:

1. Important variables such as cognitive developmental level and I.Q. were not being assessed for this study; language scores and mathematics scores in most cultures correlate highly with scholastic ability (See Chapter 2) and were used as indicators of these variables in this study.

2. The study can not be generalized to the small schools in the region.

3. The study was conducted in the southwestern region of Saudi Arabia; therefore, it can not be generalized to other regions in the country, or other countries.

5. The study can not be generalized to the secondary schools for girls in the region.

DEFINITION OF TERMS

The following definitions of terms are used:

1. Day-time public secondary school: an educational

institution which is controlled, supervised, and supported by the Ministry of Education. These schools include grades ten, eleven, and twelve for male students only.

2. Arabic achievement: the scores of Arabic grammar and literature of the 12th grade students in the science division. These scores were obtained from the tests that all students took at the end of the first term of each academic year.

3. Mathematics achievement: scores obtained from administering a translated version of the California Achievement Test (form C) are being used as the mathematics achievement scores at the 12th grade level.

4. Biology achievement test: the achievement scores obtained by administering a biology test (Al-Shahrani Biology Achievement Test) to the 12th grade students. The biology test has been developed by the researcher, based on the analysis of biology curriculum in Saudi Arabia.

5. Art division: the division in secondary school which concentrates on subjects of letters and humanities in the 11th and 12th grades.

6. Science division: the division in secondary schools which puts emphases on subjects of biological

and physical sciences for students in the 11th and 12th grades.

7. Socio-economic background: the students' socio-economic background is represented by family background such as education and occupation of the parents.

8. Katateeb: old fashioned schools usually associated with the Muslems' mosques, operated by individual teachers, and not a part of the official national education system.

9. Teacher background variables: age, nationality, degree held by the teacher, major, years of science teaching experience, number of classes per week, and teachers' opinion toward teaching and facilities available to them.

10. School variables: school size, location, number of science students, student-teacher ratio, number of science classes, number of new students at the 10th grade, number of students who graduated in the last year, type of building, and resources.

11. Public secondary examination: a national examination for all 12th grade students. The national examination includes a test on each subject offered at the 12th grade. This test is developed by the Ministry of Education and is given to the

students at the end of the second term of the academic year.

12. Secondary education certificate: this certificate is issued to all students who have passed all subjects successfully in the public secondary school examination. Students who have the secondary certificate are eligible to continue their higher education in their country or abroad.

13. Science Classroom Activity Checklist :Teacher's Perception (SCACL:TP): the use of this questionnaire helps to collect information about science classroom activities. This instrument has been developed by Howe and Brown (1970) (adapted from Sagness) at The Ohio State University and has been used successfully in many studies.

14. Checklist for Assessment of Science Teachers (CAST): Pupil's Perception: this instrument is used to collect information related to the relations between teachers and students. CAST also has been developed by Howe and Brown (1970) and has been used successfully in several studies.

HYPOTHESES

The major hypotheses to be examined in this study are the following:

Hypothesis one: There are several significant predictors of grade 12 biology achievement. These predictors will include the following variables (.05 level).

Student Characteristics

a. Student home background variables:
   1) parental job and occupation.
   2) parental educational level.
   3) number of brothers and sisters and their education.

b. Student academic background
   1) Mathematics achievement.
   2) Arabic achievement (literature and grammar)

c. Student age and nationality. Student age includes three categories; 17-19, 20-22, and more than 23 years. Nationality includes Saudi Arabian or non-Saudi.

d. Reasons for selecting science division. Reasons include personal or parental decisions, friend's influence, job opportunities, reputation of science in the society, and previous science grades.

e. Number of years at the secondary level. The number of years at the secondary level included three, four, and more than four years.

f. Student perceptions of classroom instruction and activities.

g. Interest in science fields. Interest categories include high, moderate, low, and no interest in biology, chemistry, physics, and geology for each content area separately.

Teacher Characteristics

a. Age and nationality. Teacher age includes four age intervals; 20-29, 30-39, 40-49, and 50-60 year age interval. Nationality includes Saudi and non-Saudi teachers.

b. Degree and major. Teacher degree includes Bachelor, Masters, and Doctorate. Major includes biology, chemistry, physics, and geology.

c. Years of experience in teaching science.

d. Reasons for selecting teaching profession. Different reasons are included as personal and parental decisions, job opportunities, good salary, good reputation of teaching, interest in science, and science is easy subject to learn and to teach.

e. Number of classes per week. Teacher load includes five to more than 24 hours per week.

f. Teacher perceptions of classroom instruction.

g. Teacher opinion toward teaching, time for planning, training, and resources.

School Variables

a. School size includes large and middle size schools.

b. Location includes village, suburbs, and city schools.

c. Student-teacher ratio.

d. Number of science classes and the class size.

e. Type of buildings (governmental and rented)

f. Number of the graduates in the past year.

g. Number of new students at 10th grade.

h. Availability of materials, equipment facilities, and time for instruction.

I. Enrollment in science classes.

Hypothesis two: There is a significant difference in grade 12 biology achievement among the public secondary schools (enrolling only males) in the southwestern region of Saudi Arabia.

Hypothesis three: A regression equation can be developed that predicts a significant amount of variance in biology achievement at the 12th grade from the model on page 9. Each of the clusters will contribute significantly to the explanation of the biology achievement scores.

SUMMARY

This chapter has been concerned with a description of background information necessary to the statement of the purpose of the investigation and the formulation of the research problem. Moreover, assumptions, major delimitations, and limitations have been enumerated. Definition of major terms used in this study have been presented. Finally, several hypotheses have been stated.

Chapter two contains two parts. The first part presents a brief history of the education system in Saudi Arabia. The second part presents a review of literature focusing on the relationships between students' achievement in science and related variables.

CHAPTER II

EDUCATION SYSTEM IN SAUDI ARABIA AND REVIEW OF LITERATURE

There are two purposes which underlie the development of this chapter. The first purpose is to provide a brief history of education system in Saudi Arabia. In this part, the development of education and the structure of the school system are briefly presented. The second purpose is to present findings of studies focusing on the relationships between students' achievement in science and other related variables. These variables include (1) student characteristics; (2) school variables; and (3) teacher characteristics.

DEVELOPMENT OF EDUCATION IN SAUDI ARABIA

The education system is an integral part of the government of Saudi Arabia. The development of the education system in Saudi Arabia goes side by side with the foundation and the strengthening of the country. In 1923, King Abdulaziz called for unity and met with educated people in Mekkah. His main concern was the expansion and the spreading of education all over the country. In 1927, the first public school was established in Mekkah. This school, called the Elmi Institute, provided different courses in religion, arithmetic, reading, and Arabic language. Later in 1938, the School of Abroad Preparation was established, also in Mekkah. The major goal of this school was to prepare students to be able to continue their education at universities abroad. In this school, students were required to study for three years to be qualified to be sent abroad. One year later, in 1939, the duration of the School of Abroad Preparation changed to a six year period.

In 1945, the School of Abroad Preparation was divided to include three years of intermediate, two years of general education, and one year of high school. This school provided different courses such as religion, Arabic language, sciences, and courses in mathematics (Al-Mazyed, 1975).

With the establishment of the Ministry of Education in 1953, a new era in the development of education began. The Ministry of Education focused on the education of males only, while The

Organization of General Presidency of Girls was concerned with female education at all levels (Oliver, 1987). After the establishment of the Ministry of Education, the system of the School of Abroad Preparation was changed to include three years of intermediate level and three years of secondary level.

In recent times, secondary schools have provided three years of education to students who have intermediate certificates. After successful completion of the first year of the secondary school, 10th grade, students can go to either the science division or the art division. The selection of the division is based on the interest of the students and their science grades in the 10th grade.

Table 1 presents the weekly science periods in Saudi Arabian secondary schools. The science program of the secondary school has a total of six science periods a week at the 10th grade level. The science program of the 11th grade provides four periods of chemistry, four periods of physics, one period of geology, and three periods of biology a week. The science program of the 12th grade also has a total of 12 periods of chemistry, physics, biology, and geology per week.

Table 1

Number of Science Classes per Week in Secondary Schools in Saudi Arabia*

Grade	Biology	Chemistry	Geology	Physics	Total
10th	2	2	--	2	6
11th	3	4	1	4	12
12th	3	4	1	4	12
Total	8	10	2	10	30

* Obtained by the author from school schedules - 1988

Students in the science division concentrate on science and mathematics subjects. Before 1970, biology was not included in the science program at the 10th grade. Al-Mazyed (1975) stated that the omission of biology at the 10th grade affected students who were willing to enter the science division. However, the curriculum changed in 1975/1976 and introduced biology to the 10th grade.

The early curriculum of the high school was highly influenced by the curriculum plans of neighboring Arab countries such as Egypt. There was also a lack of well trained and qualified national teachers with needed expertise, and also of facilities and research.

THE STRUCTURE OF THE SCHOOL SYSTEM IN SAUDI ARABIA

General education is not compulsory at any age in Saudi Arabia. However, the government encourages everyone to attend school. The country's educational establishments are of two kinds; the first kind offers general education and the second kind offers specialized training. The implementation of the three progressive five-year plans (1970-1985) has contributed to the development and the improvement of the educational system in the country. However, during these years, the country faced different problems. Some of them are considered to be persistent problems such as a shortage of science and mathematics teachers, and the use of traditional teaching methods.

The Saudi Arabian educational system has special characteristics. Emphasis on religious studies (Koran, Islamic Tradition, Theology, and Jurisprudence) is the first characteristic of the system.

The second characteristic is the separation of male and female education. The separation of sexes is strictly maintained throughout the education system. The process of separation of boys and girls education has religious roots, and it involves separate buildings and staff. However, at the higher education level, men can teach women through closed circuit television.

Rapid growth is the third characteristic of the education in the Kingdom. In the late 1940's, there were only 65 schools. By 1988, there were 8172 schools, 1326 schools and centers for adult education, and seven universities (Ministry of Education, 1988).

In Saudi Arabia, the present pre-college education system is composed of three stages. The first stage includes six years of primary (elementary) education; the second stage covers three years of intermediate education, and the third stage include three years of secondary education (Figure 3, p29).

There are other educational organizations which are operated by the Ministry of Higher Education, Ministry of Defense, Ministry of Health, Ministry of Social Affairs, and the Ministry of Agriculture. In 1979-1980, about 6 percent of all students in Saudi Arabia were enrolled in these different institutions that are not supported or supervised by the Ministry of Education.

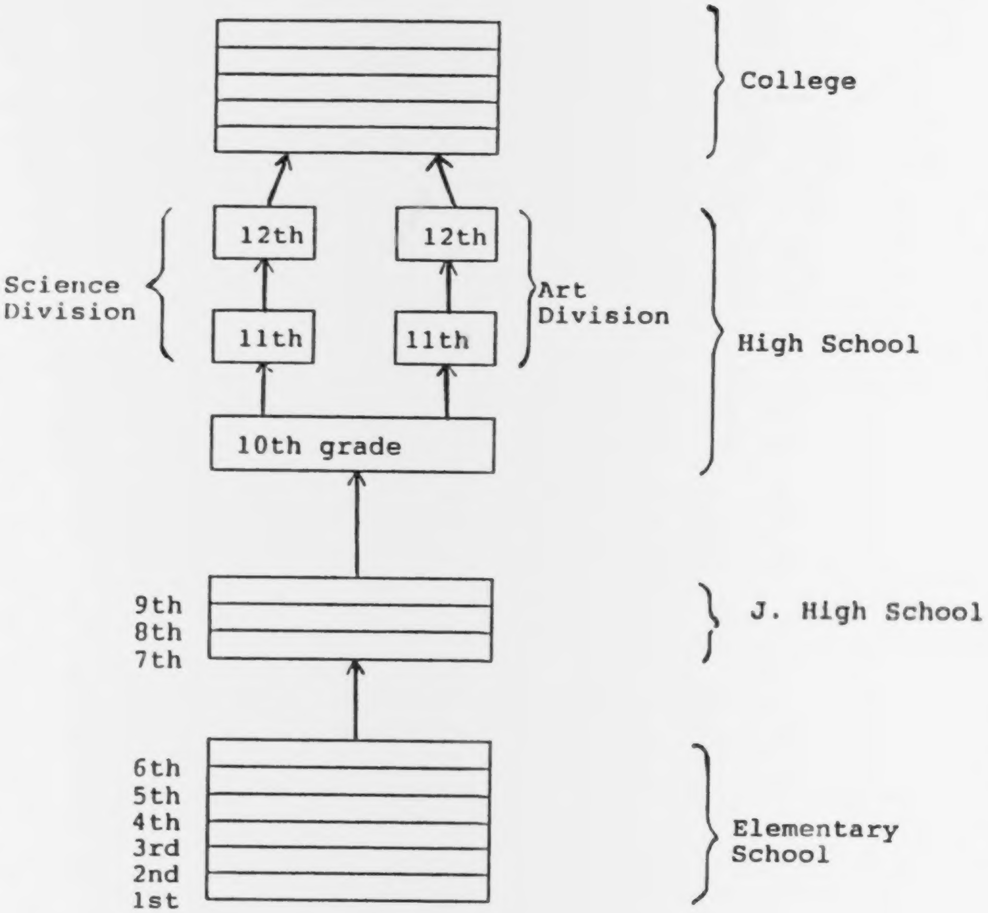

College
12th
12th
Science Division
11th
11th
Art Division
High School
10th grade
9th
8th
7th
J. High School
6th
5th
4th
3rd
2nd
1st
Elementary School

Figure 3. Education System in Saudi Arabia as of 1989

Elementary Education

Students must be six years old in order to be admitted to the elementary schools. After successful completion of six years in the elementary grades, the students receive an elementary education certificate. The curriculum of the elementary schools is standardized throughout the country. More than 50 percent of the students' classes are devoted to religious and classical Arabic studies. About 25 percent of the students' classes at the same level are devoted to arithmetic and general science. The rest of the time is devoted to social studies, art, and physical education. Students at these grades are evaluated at the end of each term and students must show mastery to be moved up to the next level. Students who fail to master some subjects have an opportunity to retake exams in these subjects before the beginning of the following academic year. Those who can not pass the second examinations will repeat the same grade for another year.

Intermediate Education

Students with an elementary school certificate are able to enroll in the intermediate schools for three years, leading to an intermediate certificate. The English language is introduced to the curriculum at the 7th grade. Students who graduate from the 9th grade will be able to continue their education in different types of schools such as general public secondary schools, teacher institutes, commercial secondary institutes, or industrial and vocational institutes. The number of students at the intermediate level has increased in the last 24 years (see Table 2).

Table 2

The Enrollment of Students at the Intermediate Level in 1965, 1975, 1985 and in 1988. *

Academic Year	Number of Students
1964-1965	19,142
1974-1975	98,339
1984-1985	219,553
1987-1988	246,004

* Summary Statistics on Education, Ministry of Education, Saudi Arabia, 1984, 1988.

The growth in the enrollment forced the Ministry of Education to build and rent many school buildings and to hire more teachers at this level.

Secondary Education

After the separation of intermediate education from secondary education in 1958, secondary education was expanded, but at slower rate in comparison to elementary and intermediate education.

Secondary education has three levels represented by the 10th, 11th, and 12th grades. In the first grade (10th grade) of high school, all students are introduced to the same curriculum. After the completion of the 10th grade, the curriculum is divided into two divisions, the science division and the art division. English and Arabic language are emphasized in both divisions. Mathematics and science courses are the major part of the curriculum in the science division. The students in the art division concentrate on social studies courses.

Students at the 12th grade must pass the National Secondary Examination to receive a general secondary education certificate. The enrollment in the secondary school level has increased substantially during the last 18 years (see Table 3).

Table 3 indicates the great growth in enrollment at the secondary education level. In recent times, the rapid growth in the enrollment at the high school level required the Ministry of Education to expend a lot of effort and money to provide all students with the opportunity for secondary education leading to college education.

Table 3

Growth of the Enrollment in Grade 10 and 12 (Science and Art Divisions) in Secondary School in Saudi Arabia.*

Division	1969-1970	1987-1988
Science	2,895	34,779
Art	3,364	20,371
Total	6,259	55,150

*Summary Statistics on Education, Ministry of Education, Saudi Arabia, 1984, 1988.

Higher Education

Higher education began in 1949 when the College of Islamic Law was established in Mekkah. This college provided courses in religion and trained teachers for secondary school teaching. At the present time, there are seven universities in Saudi Arabia. Four of them emphasize arts and sciences, and the other three are specialized institutions.

In recent years, higher education has had the highest growth rate in the number of students and teachers. This growth reflects the government's goals of expanding the Saudi specialized manpower and upgrading research and development.

Proportion of Male Saudi Staff in Teaching Positions in Pre-college Education

Over the last 13 years, there has been an increase in the number of Saudi teachers at all levels of schooling. In 1975, Saudi teachers occupied less than one-third of the teaching positions at the intermediate levels. During the 1987-1988 academic year, national teachers amounted to about 52 percent of the teaching staff at this level.

In 1975, Saudi teachers filled less than one-fifth of the teaching positions at the secondary level. About 27 percent of the teachers were Saudis in 1980. In 1988, national teachers represented approximately 38 percent of the teaching staff at the secondary level (Nyrop et al, 1976; Ministry of Planning, 1980; Ministry of Education, 1988).

REVIEW OF LITERATURE RELATED TO THE STUDY

This part has the following sections: student characteristics; teacher characteristics; and school variables.

SECTION ONE: STUDENT CHARACTERISTICS

This section has five parts: (1) summary; (2) student home background; (3) student academic background; (4) interest in science fields; and

(5) variables not included in the study.

Summary

Students' characteristics analyzed included home background, students' academic background, students' interest in science field, and selected variables not included in the study. Socio-economic status as defined by educational and occupational levels has been the most frequently studied home background characteristic, and it has been consistently related to achievement. Obtained correlations between family background and various measures of academic achievement range from .10 to .60 in different studies. Several reviews of the literature have been completed, and no clear explanation of the wide variation in the magnitude of the correlation between achievement and home background variables was found. However, the correlation between home background variables and science achievement showed a range of .25 to .40.

Students' academic background such as mathematics, language achievement, and other variables showed a strong significant association with academic achievement. The correlation between academic background variables and science achievement ranged from .40 to .50 (accounted for 16 to 25 percent of variance in science achievement).

Finally, there are consistent relationships between students' characteristics and students' learning outcomes. Students' scholastic ability and socio-economic background account for 20-50 percent of the variance in science achievement.

Student's Home Background

In the Kingdom of Saudi Arabia, no related studies were identified.

Different studies related to this topic were found in the United States and other countries.

Fedigan (1978) presented a summary of research about the effects of various factors on achievement. Fedigan reported that there was a positive relationship (r=.26) between student academic achievement and socio-economic level. Also, parent education was positively correlated with achievement.

Lewis (1986) found that school achievement was affected by different varaibles or factors. Parental occupation was significantly associated with achievement of elementary and junior high school students. Elementary and junior high school achievement had a correlation of .56 and .34 with socio-economic background respectively (p<.001).

Wilson (1969) found that parent's occupation was the strongest variable related to the students' achievement in their schools. Also, the education level of the students' parents had a strong influence in the students' achievement in science. Klein (1971) reported a significant differences at the .01 level between science achievement and low, middle, and high socio-economic groups when test score means were adjusted for I.Q. differences. Peaker (1971); Belz et al. (1984); and Blosser (1984) reported that home variables had recognizable contributions to the improvement and the progress in students' achievement in science and other fields.

Thorndike (1973) stated that home background variables of the students seem to be strong predictors of students' achievement. He reported the median correlation between background variables such as father's education and occupation and the achievement in science to be .23 and .17 respectively. National Assessment of Educational Progress (NAEP,1973; Schieci, 1986) reported that students whose parents had higher education degrees had higher science learning outcomes than students who came from families where parents had lower educational levels, such as less than a secondary school diploma. .The analysis of the studies in the six International Association for the Evaluation of Educational Achievement (IEA) revealed that home background variables explained 11 percent of the variance of science achievement (Walker, 1976).

Alani (1978) found a difference in the students' science achievement according to their socio-economic background (SEB). He reported that students who came from higher social class communities in Iraq performed better in science than those who came from lower social class communities. Fotheringham et al. (1980) reported that the high achieving students had fathers whose mean years of schooling was grade 10 or higher. The low achieving students had fathers with less than 10 years of schooling. Postlethwaite (1980) stated that there is a weak relationship between home background variables and school achievement in developing countries.

Burstein et al. (1980) studied the multilevel effects of student background on science achievement in the United States, England, and Sweden. They concluded that the relationship of students' relative background and relative achievement within school was strong and consistent across countries. Kremer and Walberg (1981) conducted a meta-analysis of [illegible] studies covering 15 years (1964-1979). They stated that the students of higher SES homes had higher scores in science achievement. They reported a mean correlation of .25 between socio-economic background and science achievement in three studies.

The result of the meta-analysis study conducted by Fleming and Malone (1982) showed that the correlation between socio-economic status and science achievement was .25 for 21 studies involved in their analysis. They found a mean correlation of .42 between home environment and science achievement with 18 percent of the variance explained. Kahl (1982) found a mean correlation between socio-economic variables and science performance of .30 in nine studies that were analyzed.

Using meta-analysis techniques, White (1982) concluded that SES, with students as the unit of analysis, is positively but only weakly correlated with measures of academic achievement. White stated that the relationship between home background variables and academic achievement was probably much weaker than what many people have assumed (r=.22).

Johnstone et al. (1983) studied the effect of different aspects of students' home background and out-of-school factors on academic achievement in Indonesian elementary schools. Their findings indicate that several aspects of students' home background variables have different degrees of influence on student achievement. heyneman and Loxely (1983) reported that parents' educational and occupational status explained only 3 percent of variance in the achievement of science among East Indian children.

Studying the achievement in seven Latin American countries, Sanguinetty (1983) reported that there was a strong correlation between family factors such as parent educational level, and student achievement in science and reading comprehnsion. He noticed that the importance of family variables decreases as students move to higher levels in their schools.

Maqsud (1983) conducted a study to examine the effects of socio-economic background, intelligence, self esteem, and locus of control on academic achievement of Nigerian secondary school students. The result showed that there is a significant association between socio-economic background and achievement in mathematics and English ($p<.05$).

In summarizing research on parent involvement and student's performance, Becher (1984) states that parents of students who scored higher in measures of achievement exerted more pressure for achievement by providing more academic guidence and exhibited a higher level of general interest in their children. Olson (1984) investigated the home environment variables (parental education and occupation) and their relationships to the students' achievement at the elementary school levels (third through fifth grade). In this study, family socio-economic status was positively associated with students' achievement.

Walberg (1986) found a median correlation of .32 between home environment variables and learning outcomes in science. Lee (1987) found that home background of Chinese students accounted for nine to 13 percent of the variance of science achievement.

Fehrmann et al. (1987) reported that the family background variables have direct and indirect effects on students' grade at the high school level. They found a correlation of .20 between academic achievement and student home background.

Student's Academic Background

Mathematics achievement.

In Saudi Arabia, Khouji (1982) found that there was a high correlation between science courses scores and mathematics scores in a suburban middle school (n=170) in Jeddah. He reported that biology achievement correlated with all courses offered at the tenth grade, except the subjects of religious studies. The correlation between biology achievement and algebra achievement was positive and significant ($P<.05$), and ranged between .50 and .85 for the classes studied. Moreover, the correlation between biology achievement and geometry achievement had a range of .45 to .76 (accounting for 20 to 57 percent of the variance in biology achievement).

Several studies have been conducted in the United States and other countries to determine the relationship between achievement in mathematics and science achievement.. Almost every study shows that the mathematics achievement is a strong and a significant predictor of science achievement.

The result of the meta-analysis conducted by Fleming and Malone (1982) showed a high correlation between mathematics and science achievement. They reported that the mean correlation between science and mathematics achievements was .42 in 13 studies. Also, Kahl (1982) indicated that there was a relationship between mathematics and science achievement. Kahl found a mean correlation of .46 in eight studies which were analyzed. Finally, Galitsis (1986) stated that mathematics achievement was a strong predictor of science achievement. Lee (1987) found that the ability of Chinese students in mathematics accounted for about 20 to 30 percent of the variance in science achievement.

As a result of the research studies that investigated the relationship between mathematics achievement and science achievement, findings showed that mathematics achievement explained 15 to 25 percent of variance in science achievement with a mean of 20 percent, and is strongly related to science achievement.

Language achievement.

In Saudi Arabia, Khouji (1982) reported that the correlation between Arabic Literature performance and biology achievement was positive and significant ($p<.05$) and ranged between .26 and .71. Also, he reported that the correlation between biology performance and Arabic grammar achievement ranged between .31 and .59 (accounting for about 10 to 35 percent of variance in biology achievement).

In the United States and other countries, several reviews of research and meta-analysis were found in which language ability has been related to science achievement.

Williams (1968) found a significant increase in science achievement of the sixth grade students. The increase was attributable to reducing the reading level of materials used in schools; this also shows a relationship between reading achievement and achievement in subject areas. National Assessment of Educational Progress (NAEP,1973) data showed a decline in science scores. The major hypotheses for this decline was that it was related to the declining reading level of the students.

In the international evaluation of reading comprehension, the correlation between reading comprehension and science achievement was significant and had a correlation of .50 (Thorndike, 1973). Green and Szabo (1978) found that students with higher reading ability scored higher on a science achievement test than those of moderate to low levels of reading abilities. Fleming and Malone (1982) found a mean correlation of .41 (five studies) between science achievement and the language ability. Kahl (1982) found a correlation of .55, in 13 studies, between science achievement and language (verbal) ability.

Tate and Burkman (1983) found that reading ability always has a positive and significant effect on science achievement. Friend et al. (1984); Horton (1986) state that students who had a high ability in reading and writing had higher achievement scores in science. Lee (1987) reported that the correlation between science achievement and language ability (Chinese) ranged from .36 to .50.

The relationship between language ability or achievement and science achievement appears to be consistent over time. The results of the studies of Williams, Thorndike, and NEAP are similar to the results obtained in more recent studies. Language ability is strongly related to science achievement and generally explains 10 to 25 percent of the variance in science achievement.

Student's Interest in Science Fields

No studies were identified related to Saudi Arabia.

In the United States and other countries, different studies related to student interest and achievement were identified.

Hasan (1975) studied the factors that effect science interests of secondary school students. He stated that interest in science seemed to be related to student variables such as sex , attitude, and achievement. Fleming and Malone (1983) reported that interest in science was positively related to high performance on other science fields.

Harty et al. (1985) examined the relationship between the elementary school (fifth grade) students' achievement in science and their attitude, interest in science, reactive couriosity, and scholastic aptitude. They found a significant correlation ($p<.01$) between interest in science and science achievement ($r=.13$).

Jacobson and Doran (1986) found that students who were highly interested in science performed higher in science achievement. Wakefield (1988) found that interest in science correlated significantly with achievement in science ($p<.05$). The relation between interest in science and science achievement had a correlation of .29.

Data in these studies show that students' interest in science makes a significant difference in science achievement. However, the correlation between science interest and achievement is low.

Student's Variables Not Included in the Study

Logical reasoning skill.

Logical reasoning skills have been found to be related to achievement. It frequently accounts for 7 to 12 percent of the variance after mathematics and language achievements.

In Saudi Arabia, Al-Mazroe (1982) found that there were positive and significant relationships between students' level of reasoning and their performance in physics at the high school level.

Crow and Haws (1985) assessed the effectiveness of integrating logical skills into geology course designed for non-science students. The findings of this study suggested that individuals who taught specific rules thinking through the use of logic can achieve higher in geology.

Developmental level.

In Saudi Arabia, no related studies were identified.

Different studies were found related to this topic in the United States and other countries. Pettus et al. (1980) studied the relationship among the science process skill levels at the secondary school and their classification according to age, sex, grade level, number of science courses, and interest in science careers. They found that the mean score increased with higher grade level and the students who were interested in some areas of science for a career had higher mean scores than those who were not interested. Also, they found that the number of science classes completed accounted for about 15 percent of the variance.

Lawson (1983) stated that students' developmental level and their prior knowledge are considered to be predictors of achievement in science. Mostafa (1985) studied the relationships among cognitive development, spatial ability, and science achievement. Also, Mostafa considered sex, grade level, and activities during this study. The result showed that combinations of spatial ability, cognitive development, sex, and grade levels explained 43 percent of the variance in science achievement.

Zeitoun (1988) studied the relationships between abstract achievement and prior knowledge, formal reasoning and sex among 12th grade students in Egypt. He found a strong correlation between prior knowledge and achievement of abstract concepts (r=.74). Also, he reported that achievement of abstract concepts in genetics showed a strong association with formal reasoning (r=.53).

Learning style.

In Saudi Arabia, no studies related to learning style and science achievement were identified.

In the United States and other countries, several studies were found relating academic achievement and learning style. The effect of learning style and teaching style on student achievement was not ignored. The importance of matching the students' learning style with the teaching style has been extensively studied (Dunn and Dunn, 1979).

Dunn (1984) concluded, after reviewing related literature, that learning styles are consistently related to increased academic achievement, improved attitude toward school, and reduced discipline problems. Fields (1985) conducted a synthesis of research related to learning abstract concepts. Fields reported that field dependent learners favored concrete operations; while field independent students favored higher cognitive ability levels. Finally, Fields concluded that field independent and higher cognitive ability appeared to be strong predictors of achievement.

Welborn and Conti (1986) studied the effect of learning styles and teaching styles and achievement. The study showed that health professional students achieved differently according to their preferences for the mode of learning.

SECTION TWO: TEACHER CHARACTERISTICS

This section has the following parts: (1) summary; (2) teacher's variables included in the study; and (3) teacher's variables not included in the study.

Summary

There is no doubt that the teacher is one of the keys to effective science instruction. Different studies were conducted on the relationships among science teachers' characteristics and student achievement. These studies identified and analyzed cognitive and affective factors influencing these relationships and different interesting results have been already reported (Power, 1977). Avalose (1980) reported that there was a relationship between teachers' characteristics and students' achievement in different subjects.

Previous science training as measured accounted for very little of variation in students' achievement in science. Teacher science knowledge as previously tested accounted for four percent or less of the variation in student science achievement.

The mean correlation between teacher characteristics and students' achievement tends to be low compared to students' characteristics. Usually, teacher's characteristics account for less than five percent of the explained variance in science achievement. Individual studies relevant to the study are discussed in the following sections.

Teacher's Variables Included in the Study

Teacher's characteristics could include the college's teacher program, courses taken by the teacher, type of degree a teacher has, years of experience in teaching, and age.

Teacher's academic background.

Teacher academic background includes college's teacher program, courses taken by the teacher, and type of degree a teacher has.

In Saudi Arabia, no related studies were identified.

In the United States and other countries, reviews of research and meta-analyses have been conducted related to teacher background and students' achievement.

Fuller and Chantavanich (1976) found a significant correlation (r=.11) between academic achievement of Thai primary school students and teachers schooling. Fagon (1981) reported that teacher qualifications and area of training were substantially related to students' achievement in lower achieving schools.

Saha (1983) compared the effect of teacher variables on students' achievement on developed and less developed countries. Saha concluded that, in some studies, teachers' variables as teacher credentials and certifications had a positive impact on students' achievement.

Druva and Anderson (1983) stated that there was a positive relationship between students' learning outcomes and the background of their teachers. They found significant correlations between students' achievement and the scientific courses taken by teachers. They reported a mean correlation of .05 between teachers' characteristics and their effectiveness in teaching as measured by students' achievement.

Shymansky (1984) stated that educational background of the teacher was also important in the success of teachers in teaching BSCS programs. Students of a teacher who had a masters degree or higher outscored students in traditional curriculum. This indicates that teacher background and experience do have an effect on teacher's ability to understand goals and objectives of the new programs and to teach them more effectively.

Al-Zameli (1985) studied the relationship between teachers' evaluation and students' academic achievement in elementary level in Iraq. Moreover, he investigated whether this relationship was influenced by teacher academic background, sex, and experience. He reported that there was a high and a positive relationship between teachers' evaluation and students' performance in science. Also, the results indicated that teachers' academic background, sex, and experience made no significant differences between teachers' evaluation and students' achievement.

Fuller (1987) reported that teachers' quality in the Third World were related to achievement, specially years of experience and teacher training; in Puerto Rico, teachers' schooling level significantly correlated with the academic achievement of students at the primary school levels. Also, Fuller reported that the relation between teacher's school attainment and student achievement had a significant correlation of .34.

Teacher's experience.

In Saudi Arabia, no related studies were identified.

In the United States and other countries, several research studies and reviews of research were found in which teacher experience has been analyzed for its effect on achievement of the students.

In studying the effect of teaching experience, Wright and Nuthall (1970) found that more experienced teachers tended to ask higher order or more open type questions and allow their students more opportunities to explain and expand their answers to questions. Beebout (1972) found that the length of the teacher's experience was associated with students' achievement in Malaysia.

Summers and Wolfe (1975) found that teaching experience had a differential effect upon the achievement of high and low achieving students. They reported that students with high ability at the primary school did best with more experienced teachers and low ability students showed greater gains with less experienced teachers.

Shymansky (1984) found that a class whose teacher had more than 5 years of experience in teaching outscored 88 percent of traditional course counterparts. Fuller (1987) stated that in the early IEA survey, teacher experiences appeared to make a significant differences in students' achievement.

Teacher's Variables Not Included in the Study

Teacher's practices.

In Saudi Arabia, Harty and Al-Faleh (1983) studied the differences between two chemistry teaching methods (large lecture-demonstration and small group laboratory approaches) on students' chemistry achievement and attitude toward science at the secondary school level in Saudi Arabia. Their findings revealed that the small group laboratory students outperformed those of lecture-demonstration group. Moreover, they concluded that Saudi science teachers need an extensive training in laboratory methods.

In the U.S. and other countries, several research studies and meta-analyses were found in which teacher practices have been analyzed for their effects on students' achievement.

Smith (1977) and Smith et al. (1981) studied the effect of teachers' vagueness on student achievement in biology and mathematics. Their findings recognized the importance of clarity in teaching high school biology and mathematics. Also, they reported that teacher vagueness terms significantly affected student performance in science and mathematics. For example, they found a negative correlation between students' achievement in high school mathematics and the frequency of teacher vagueness terms.

Brookover et al. (1979) found that teachers spent more time on instruction in the higher achieving schools. Tobin (1980), and Tobin et al. (1982) investigated the variations in teacher wait- time and quality of teacher questioning and their relationships to science process achievement. They stated that teacher wait-time was one of the strongest predictors of achievement in science process. Also, their results indicated that teachers could increase process skill achievement in science by increasing teacher wait-time.

Using meta-analysis techniques, several researchers identified different teaching techniques and their relations to learning outcomes (Walberg, 1980; Wise & Okey, 1983; Boulanger, 1980). The results of these studies showed that the use of various instructional strategies produced different effect sizes. For example, Wise and Okey (1983) reported that the effect size of different instructional strategies on students' learning had a wide range (effect size of .90 in wait-time to -.15 in grading technique) with a mean effect size of .35.

Lott (1983) conducted a meta-analysis on inquiry teaching and advanced organizers. He found that inductive teaching showed a positive effect size.

Walberg (1986) examined and studied several studies related to instruction and reported that direct teaching had a mean correlation of .23 with achievement. Also, Walberg reported that the effect of questioning levels (high and low) had a mean correlation of .70.

Teaching style.

No studies were identified related to Saudi Arabia.

In the United States and other countries, there have been several research studies in which teaching style has been found to be related to students' achievement. The importance of matching teaching style with students' learning style has been stressed in the literature (Dunn and Dunn, 1979).

Conti (1985) investigated the relationship between teaching style and students' achievement. The findings of this study indicated that teachers tended to favor a teacher-centered approach. Also, the study showed that a relationship existed between the teaching style used and students' achievement in adult learning settings.

Welborn and Conti (1986) reported that teaching style is a major influence on the achievement of health professional students. Students of teachers with a moderate or moderately higher preference for a teacher-centered approach to classroom instruction achieved higher than other students with teachers who did not prefer this style of teaching. Bourk (1986) studied the relationships between class size, teaching practice, and students' achievement. The results indicated that some specific teaching practices linking class size and achievement accounted for significant part of variations in achievement.

Dunn et al. (1986) suggested that significantly increased achievement resulted when teaching resources and strategies complemented students' learning style. Mendez and Ramose (1987) stated that the teaching style of basic sciences that a teacher involves seems to discourage students from attending their lectures. Harpole (1987) studied the relationship of gender and learning style to achievement and laboratory skills in secondary school chemistry students. The results showed that learning preference was the best predictor and explained about 21 percent of the variance in chemistry achievement.

Teacher's training (inservice education).

In Saudi Arabia, no related studies were identified.

In the U.S. and other countries, different studies and meta-analysis have analyzed the relationship of inservice education programs to students' achievement.

Pinkall (1973) studied the effects of a teacher in-service education program on fifth and sixth grade teachers, and the students whom they teach, in their knowledge of scientific processes, scientific content, and attitudes toward science and scientists. The result indicated that students of teachers who participated in inservice training scored significantly higher in science tests (at the .05 level) than did those of teachers who did not participate in the training program.

Haron (1977) found a positive correlation between the time that teachers spent in training and their students' academic achievement (r=.27). O'Sullivan (1981) stated that selected strategies emphasized in an in-service training programs had a positive relation with students' achievements in the concepts and the process of science.

Druva and Anderson (1983) emphasized that science training is related to teacher performance and consequently to the students' achievement in science. Purkey and Smith (1983) found that different school variables to be important predictors of students' academic achievement. For example, staff development was one of these variables which indicated a substantial relationship with student achievement.

Miller and Ellsworth (1985) reported that there was a significant difference between the students' academic achievement of teachers who participated in in-service education programs and between those whose did not. Brophy (1986) reported that training teachers in a package of instructional principles was found to be correlated with students' achievement.

Inservice education has been found to be significantly related to science achievement. More specifically, inservice education programs that deal with specific topics, knowledge, and attitudes could be used as variables for evaluating the effects of inservice education on teachers and on their students.

Teacher's expectations.

No studies were identified related to Saudi Arabia.

In the United States and other countries, different research studies and research reviews have analyzed the relationships between teachers' expectations and students' academic achievement.

McDonald an Elias (1976) investigated the overall effect of teacher's expectancy upon students' achievement. They found that teachers' expectations were consistently and significantly related to student achievement. The effect was quite small and explained three to nine percent of the variance in students' achievement. Fuller and Chantavanich (1976) reported that the level of teacher expectations of higher pupils' achievement was related to their actual achievement. They found a modest relationship between students' achievement and teacher assessment of their learning ability (r=.22).

Purkey and Smith (1983) reported that high teacher expectation was one of the variables that accounted for effectiveness in schools. Aiello-Nicosia et al. (1984) studied the relationships among science teacher characteristics including understanding of science processes and teachers' abilities to control variables and students' achievement. They found that the ability to use processes was a more valuable than the understanding of science processes.

Evertson et al. (1984) stated that good teachers had effective instructional abilities, and they would be more effective if they had the knowledge of their fields. People who support effective school research agree that higher teachers' expectations result in improved achievement. The expectations of effective school staff are that all students can learn and teachers can get all students to learn (Steller, 1988).

SECTION THREE: SCHOOL VARIABLES

This section has three parts: (1) summary; (2) school variables included in the study; and (3) school variables not included in the study.

Summary

School variables have also been proposed as variables related to academic achievement. Some studies indicated that school variables accounted for a significant amount of the variance of the pupils' achievement (Good & Brophy, 1986). West (1983) stated that the recent analysis suggested that public schools in the United States are significantly different and schools do make a difference.

However, other studies and reviews showed that there is a slight association between school variables and students' performance. It accounts for only a small amount of the total variance (Contra & Potter, 1980; Briemer et al. 1978; Postlethwaite, 1975). Finally, the way that schools are organized could have a significant impact on the productivity of the school. Individual studies relevant to the study are discussed in the following sections.

School Variables Included in the Study

This section includes school related variables such as enrollment, class size, location, teacher-student ratio, availablity of resources, and facilities.

School enrollment.

No studies were identified related to Saudi Arabia.

In the United States and other countries, several research studies and reviews of research were found in which school enrollment has been analyzed for its effect on achievement of the students.

Cronbach (1970) mentioned that there were differences in achievement associated with the size of the school. Keeves (1973) reported that in the IEA science evaluation, three countries showed that large size schools had higher achievement scores than those of small schools.

Shymansky (1984) reported that students in large schools (enrollment over 2,000 students) responded more favorably to BSCS than did students from smaller schools. He stated the possibility that large schools had more funds available for facilities and equipment to implement the program more effectivelyy than smaller schools. Lee (1987) found that students in large size schools (grade three and four) performed slightly better in science and mathematics than students in middle size schools. However, school size accounted for less than one percent of the variance in science achievement.

Summers and Wolfe (1975) reported that smaller schools were associated with increased learning at both elementary and secondary levels. Moreover, Lewis (1986), Stemnock (1974) noted that larger schools tended to have lower achievement.

Class size.

No studies were identified related to Saudi Arabia.

In the United States and other countries, several research studies and reviews of research were found in which class size has been analyzed for its effect on achievement of the students.

Glass and Smith (1978) conducted a meta - analysis on the outcomes of 77 studies. These studies included 725 comparisons between smaller and larger classes achievements. They found that reduced class size can be expected to produce increased academic achievement. They found that the relationship seems slightly stronger at the secondary levels. Educational Research Service (ERS,1978) concluded that the class size research pointed to the importance of methods and quality of instruction rather than the number of students in class.

Glass and Smith (1980) reported that smaller classes lead to higher expected achievement. Schiefelbein and Farrell (1983) found that the average class size of a secondary class is a powerful predictor of students' achievement. Wise and Okey (1983) reported that students in small classes achieved higher than those in large classes. They found that the mean effect size of small classes (fewer than 15 students) was .74 and larger classes seemed to have low effect sizes.

Micik (1986) found that there was an inverse relationship between a student's class size and science achievement (r=-.25). Fuller (1987) reported that the class size with the normal range showed no consistent impact on achievement on 11 of 21 analyses, while other studies (5 studies) indicated that students working with larger classes performed at higher level.

Location.

No studies were identified related to Saudi Arabia.

In the United States and other countries, there have been several research studies in which school locations have been found to be related to students' achievement.

The results of the National Assessment of Educational Progress of Science (NEAP) indicated that suburban students had achievement above the national average, but students from inner city and rural areas showed lower achievement than the national average (NAEP, 1971; NAEP, 1973; NAEP, 1977). Klitgaard et al. (1974) reported that many of the outstanding schools were rural schools. Martin (1979) stated that rural students have traditionally performed below the national level.

Studying 12 secondary schools for three years, Ruttre et al. (1979) reported that some urban schools were better than others in promoting the achievement of the students. Also, they reported that the differences between schools in their study were not due to physical factors of the school such as size and age of building. Shymansky (1984) reported that BSCS programs were more most effective when implemented in suburban and urban schools.

Teacher-student ratio.

In Saudi Arabia, no related studies were identified.

In the United States and other countries, several research studies and reviews of research were found in which teacher-student ratio has been analyzed for its effect on achievement of the students.

McNamara et al. (1988) reported that teacher-pupil ratio is associated with higher reading achievement. Seyfarth (1988) studied the effect of reduction in teacher-pupil ratio on reading and mathematics achievement in grades 4, 8, and 11. The results indicated that reduction in the teacher-student ratio is expected to lead to increased students' achievement. The researcher stated that the reduction in student-teacher ratio had advantages, such as more time was given to individual students by teacher and the reduction in the ratio led to success and lower dropouts of schools. Wise and Okey (1983) found in their meta analysis that students in smaller classes achieved better than those in larger classes.

Resource and facilities.

In Saudi Arabia, no related studies were identified.

In the United States and other countries, several research studies, reviews of research, and meta-analyses were found in which school resources and facilities have been analyzed for their effects on achievement of the students.

Farrell et al. (1978) suggested that the individual school quality variable with the most consistent positive effect on achievement was textbook availability. Heyneman et al. (1980) studied different factors that likely influence student learning outcomes in Uganda. School facilities were among the predictors of students' performance at the primary school levels.

Coleman et al. (1982) reported that private schools were superior than public schools in terms of producing academic achievement. However, Staver and Walberg (1986) criticized the report of Coleman and his associates, and stated that the differences in science achievement between the two type of schools were attributable to relatively fixed characteristics of students and their experiences beyond the school environments.

Heyneman and Loxley (1983) studied the impact of the primary schools on the academic achievement in 29 high and low income countries. Their findings indicate that the major influence on the students' achievement is the quality of the schools and teachers. For example, 27 percent of the variance in the achievement among East Indian children was explained by the different level of school quality. School factors do not seem to be important in explaining variation in academic achievements as long as needed physical facilities are available (Sanguinetty, 1983).

Schiefelbein and Farrell (1983) found that the textbook availability was one of the strongest predictors of the 8th grade achievement. Blamick (1984) stated that facilities, equipment, and supplies were areas of science programs most often mentioned by school staff (principals and teachers) as in need of strengthening.

In Botswana, Mwamwenda et al. (1987) investigated the relationships between academic achievement and school related variables such as availability of classrooms, furniture, and books. They reported that the performance of students in science from furnished schools had a mean of 56.1 percent and a standard deviation of 5.2 percent, where as pupils from inadequately furnished schools had a mean of 51.6 percent and a standard deviation of 4.5 percent. The mean difference for these groups was statistically significant.

Bryant (1987) reported that the success of magnet schools is enhanced when adequate resources are provided. Facilities, supplies and materials, and equipment and human resources are the ingrediants necessary to establish a unique learning experience. Finally, McNamara (1988) reported that the increase in school funding is associated with increased in reading and mathematics achievement.

Research results indicate that school variables are particularly important in explaining variations in academic achievement among students. School quality has an impact on the students' achievement and learning.

School Variables Not Included in the Study

Steller (1988) stated that research showed that some schools were better than others with similar population. He concluded that five factors were found to be consistent across different studies. These factors include strong instructional leadership by school principals, clear instructional focus, high expectations, better and safe school environment, and frequent monitoring of students' achievement. These factors work together or interact with each other to produce an effective school (Gage, 1978).

School Administration.

In Saudi Arabia, no related studies were identified.

In the U.S. and other countries, different studies and research reviews have analysed the relationship of the effect of school adminstration on student achievement.

The role of school principals is not limited to affecting the instruction, but their effect is clear on the school climate. Troisi (1983) concluded that effective administrative leadership is the key to establishing and maintaining a climate suitable to academic learning and achievement.

Research on effective schools indicated the importance of the principals as instructional leaders in the schools.

School Environment.

No studies were identified related to Saudi Arabia.

In the United States and other countries, there have been several research studies in which school environment has ben related to student achievement. School environment includes the total atmosphere that a student experiences in school.

Keeves (1975) stated that the performance of a student at the endof his/her first year at the high school level is influenced by the new educational environment. Valecia et al. (1985) studied the factors that predict the cognitive performance of Mexican-American children. They found that school language factors made an additional significant contribution to the explained variance.

Good et al. (1986) argued that schools make a difference on students' achievement. Fuller (1987) identified several school effect studies had been conducted in developing countries. He summarized 60 empirical studies and found that most of them revealed that schools had a great influence on achievement in developing countries. Steller (1988) concluded that effective schools have rediscovered that establishing a positive, safe, and orderly school culture would lead to positive students' outcomes.

Curriculum.

There has been a substantial interest in looking at the relationships between the curriculum to what students learn. The International Association for the Evaluation of Educational Achievement (IEA) conducted studies in mathematics and science in twenty-four countries at elementary, intermediate, and secondary school level.

This study was aimed to study variables related to differences in student outcomes in science and mathematics and to compare the results of the first and the second IEA studies (Rosier, 1987).

IEA (second study) has started looking for the curriculum impact on science and mathematics by using three sequential stages of the curriculum. First, the intended is the first stage and is reflected in curriculum guides, course outline, syllabi, and textbooks adopted at the educational system. The second stage in the curriculum sequence is the implemented curriculum which focuses at the classroom level. The third stage of the curriculum is the actual (achieved) curriculum (IEA, 1988; Mcknight 1987). Dossey (1985) defined the learned curriculum as what the students learned as measured by test.

IEA (1988) reported a low correlation between the intended curriculum and the student achievement. The low correlation appeared to be related to the way the curriculum was implemented by schools and by teachers.

At the same time, various researchers have been studying the impact of the curriculum stages (intended, implemented, and actual) on achievement (EPIE, 1987; Komoski, 1987).

All researchers have found significant relationships between the intended and the actual curriculum. The higher the congruence or alignment between the intended and the actual curriculum usually the higher the correlation.

However, the intended does not account for as much as the implemented. The implemented normally has two parts. The first part includes the materials used and the second part includes the technique knowledge of teachers (the way materials are presented).

When both the materials used and the techniques used in the presentation of these materials are aligned or congruent and when the intended and the evaluation are congruent, the actual curriculum achievement tends to be higher.

If either, the materials used or the technique involved by the teacher in presenting the materials are aligned but other stages of the curriculum are not congruent, the achievement of the actual curriculum tends to be lower. Moreover, if neither the materials used or the way of the presentation are congruent, the result tends to be very low (IEA, 1988; Dossey, 1985; Mcknight, 1987; Komoski, 1987; and EPIE, 1987).

CHAPTER III

METHODS AND PROCEDURES

This chapter consists of the following sections: 1) introduction; 2) the population and sample; 3) instruments used in assessment; 4) data collection; and 5) data analysis procedures.

SECTION ONE: INTRODUCTION

This chapter describes the methods and procedures which were used in this study during the process of sampling, developing and selecting instruments, collecting data, and analyzing data.

SECTION TWO: POPULATION AND SAMPLE

Population

One-hundred thirty-nine public secondary schools are supervised by 13 educational districts in the southwestern region of Saudi Arabia. All secondary schools enrolling only males in these educational districts were considered the target population for this study. Table 4 presents the educational districts, the number of secondary schools enrolling only males, and the enrollment in these districts.

Table 4

Number of Secondary Schools Enrolling only Males and Enrollment in Educational Districts in the Southwestern Region of Saudi Arabia.*

Educational Districts	No. of Male Sec. Schools	Enrollment
Abha **	22	3507
Al-Baha **	17	2538
Al-Laith	4	228
Al-Mikhwah	5	427
Al-Qunfozah	11	941
Bisha **	15	1521
Jizan **	13	1827
Mahayl Asser	8	677
Najran **	11	1557
Namas	7	976
Rajal Alma'	4	268
Sabia	13	1444
Surat Obaidah	9	912
Total	139	16823

* Summary Statistics on Education, Ministry of Education, Saudi Arabia, 1988.
** Selected districts as population for the study.

Secondary schools enrolling only males in this region represent 28.3 percent of all male public secondary schools in the country, and the enrollment of day public secondary schools for males in this region represents about 22 percent of the enrollment of all public secondary schools for males in the country (Ministry of Education, 1988). Abha, Al-Baha, Bisha, and Jizan are the largest educational districts in the region. Each district supervises and controls more than 10 public secondary schools. Each of the rest of the educational districts operates and controls 10 secondary schools or less.

Selection of Population of Districts

In order to obtain data to answer the different questions raised by this study, the researcher chose educational districts that had secondary school enrollments of 1500 students or more. Therefore, only five educational districts were included in this study. The enrollments of each school in each selected district were obtained from the educational districts. Smaller districts mostly had many small schools. Larger educational districts had several large secondary schools and few smaller schools.

Selection of School Sample

Based on enrollment and number of science classes, secondary schools were classified as small, medium, and large size schools. The very small size schools, those with enrollments of less than 60 students, were eliminated from the sample.

Smaller schools differ substantially from the larger schools in terms of background of parents, school facilities, and number of teachers. Also, small schools enroll a small percentage of the total number of students in most of the school districts. Therefore, to assess variables affecting achievement of the majority of the students, while at the same time reducing the time involved in the collection and analysis of data, these schools were not included.

From each selected district, schools were selected by the following process: Secondary schools, enrolling only males from each district, with enrollments of more than 1500 were randomly selected using a simple random sampling process. This process was conducted by random selection of secondary schools and adding the enrollment of the students in the selected schools until approximately 30 percent in a district was obtained.

From these districts, 17 secondary schools enrolling only males were selected (see Table 5).

Table 5

Educational Districts and Secondary Schools Enrolling only Males Included in the Study

Dist.	No. of Male sec. schools	No. of students	%	No. of selected schools	No. of students	%
Abha	22	3507	32.0	7	2063	36.5
Al-Baha	17	2538	23.2	3	934	16.7
Bisha	15	1521	13.9	2	731	13.1
Jizan	13	1827	16.7	3	995	17.8
Najran	11	1557	14.2	2	892	15.9
Total	78	10950	100.0	17	5588	100.0

Selection of Student Sample

Data were collected from all senior students in the science division from the selected schools. Therefore, the sample did not include those students outside the science division.

SECTION THREE: INSTRUMENTS USED IN ASSESSMENT

Biology Achievement Test

Biology achievement scores were obtained by administering the Al-Shahrani Biology Achievement Test (Appendix A). This test was developed by the researcher. The researcher analyzed biology textbooks (10th, 11th, and 12th grades) that students use in Saudi Arabian secondary schools. The purpose of the analysis of the textbooks was to prepare a table of specifications of biological topics covered in the high school biology curriculum. Based on the curriculum analysis and by studying the previous public secondary examination in biology, 60 items were developed. Bloom's taxonomy (cognitive domain) was used during the process of developing test items. The majority of the test items fall in the first two of Bloom's categories (Knowledge and Comprehension) as these are the levels emphasized by the curriculum.

Test validity.

The use of a valid, reliable, and suitable test helps to decrease measurement error in any research study. The test was developed based on the analysis of the Saudi Arabian biology curriculum. The developed biology test and the curriculum analysis were given to Saudi graduate students at The Ohio State University majoring in botany and animal sciences for review and comments. Subsequently, some minor alterations were recommended and incorporated in the final version of the test items.

Also, faculty and graduate students in science education reviewed the items, and items were modified based on comments received.

Test reliability.

To establish the reliability of the test, the test was pilot-tested in December, 1987, in Saudi Arabian secondary schools for males in the same region. The researcher analyzed the biology test for difficulty and discrimination levels using an item analysis computer program (ITEMA). The result of pilot testing of the ABAT in Saudi Arabian high school showed the developed items had an overall reliability (KR-20) of .70. Item difficulties ranged from .00 to .99 with an average value of .57. The point biserial correlations (discrimination indices) ranged from .00 to .60 with a mean of .26. The result of the pilot study was considered for test modification and improvement. Some items were modified and rewritten. The results of the pilot are reported in Table 6.

Table 6

Characteristics of Al-Shahrani Biology Achievement Test (ABAT) on the Pilot

Type of indices	Mean	Range	No. of items
Difficulty indices	.57	.00 - .20	1
		.21 - .40	13
		.41 - .60	18
		.61 - .80	23
		.81 - .99	5
Discrimination indices	.26	below .00	6
		.00 - .20	17
		.21 - .40	20
		.41 - .60	17
		.61 - .80	0
		.81 - .99	0

Test administration.

The Al-Shahrani Biology Achievement Test (ABAT) was administered to the senior students in the science division in the selected secondary schools. The test was given to the students at the end of the academic year of 1987-1988. Each school was expected to have covered all topics included. The test was administered by the researcher with the help of science teachers in each school.

Answer sheets for the Al-Shahrani Biology Achievement Test were keyed for computer scoring by the researcher. Test scores were computed using a SPSS^x computer program.

Table 7 presents the results of the reliability of the final version of the ABAT. The test items had an overall reliability (KR-20) of .77. The difficulty of the items had a range of .00 to 99 with an average difficulty of .50. The discrimination indices ranged from .00 to .60 with a mean of .29.

Table 7

Characteristics of Al-Shahrani Biology Achievement Test (ABAT) on the Final Version

Type of indices	Mean	Range	No. of items
Difficulty indices	.50	.00 - .20	2
		.21 - .40	21
		.41 - .60	18
		.61 - .80	15
		.81 - .99	4
Discrimination indices	.29	.00 - .20	14
		.21 - .40	30
		.41 - .60	16
		.61 - .80	0
		.81 - .99	0

Table 8 (page 84) presents an analysis of the biology textbooks used in Saudi Arabian secondary schools (10th, 11th, and 12th grade). Eleven biological topics were covered in the biology curriculum during these three years.

The number of pages devoted to each topic was counted and computed. For example, 28 pages were devoted to the topics of cell biology and microscope at the 10th grade level and 57 pages were devoted to the same topics at the 11th grade. Nothing related to these topics was covered at grade 12. Pages for each topic by grade and total pages related to biology instruction for each grade are reported.

Table 8

An Analysis of Saudi Arabian Biology Textbooks (10th, 11th, and 12th grades) by Number of Pages Included for Each Topic.

Topics	Grade Levels			Total	%	No. of items
	10th	11th	12th			
Cell Biology and Microscope	28	57		85	14.8	9
Nutrition and Digestion	52		30	82	14.3	8
Respiration	22		21	43	7.5	4
Excretion	17		18	35	6.3	4
Reproduction	31		15	46	7.5	5
Struc.al & Func. Organization			57	57	9.9	6
Nervous System and Control	19		23	42	7.4	5
Genetics	23	33		56	9.7	6
Variation and Classification		61		61	10.6	6
Ecology		47		47	8.3	5
Health and Diseases			21	21	3.7	2
Total	192	198	185	575	100	60

Table 9 (page 86) presents the number of items developed for each topic and classified according to Bloom's Taxonomy. The number of items was determined by selecting 60 items as a number of items for the test and distributing the items based on the pages allocated per topic.

In the curriculum (textbooks) heavy emphasis was placed on facts and understanding of concepts and ideas. Therefore, most of items were developed to fit the first two categories of Bloom's Taxonomy. A limited number of more complex items were developed to assess the use of information.

Table 10 (page 87) presents an analysis of students' success on the test. The percent of students providing correct responses is listed for each item. The mean percent of correct responses for each topic is reported. The mean percent of correct responses for each of Bloom's categories is reported.

Results are discussed in detail in Chapter 4. Analyses indicate that 50 percent or less of the students had correct scores on all topics, but two, without considering correction for guessing. Less than 50 percent of the students had correct responses on any Bloom level above knowledge.

Students clearly did not master any topics of the curriculum and data suggest much of what may have been learned at one time was forgotten.

Table 9

Number of Items by Topic and Bloom's Taxonomy for the ABAT.

Topics	Bloom Cognitive Levels						Total
	K	Comp.	App.	Ana.	Syn.	Eva.	
Cell Biology & Microscope	4	3	1		1		9
Nutrition & Digestion	3	2	2		1		8
Respiration	2	2					4
Excretion	2	2					4
Reproduction	3	2					5
Structural & Func. Organization	4	2					6
Nervous System & Control	2	2	1				5
Genetics	2	2	1		1		6
Variation and Classification	2	2	1		1		6
Ecology	2	1	1		1		5
Health and Diseases	1	1					2
Total	27	21	7		5		60

Table 10

Percent Correct Responses by Topic and Bloom's Taxonomy of the ABAT.

Topics	Bloom Cognitive Levels						Mean
	K	Comp.	App.	Ana.	Syn.	Eva.	
Cell biology & Microscope	1 (73)* 5 (27) 7 (67) 9 (56)	16 (47) 24 (71) 35 (48)	53 (25)		59 (18)		48
Nutrition and Digestion	2 (63) 12 (74) 57 (59)	15 (21) 38 (30)	47 (47) 49 (50)		22 (58)		50.3
Respiration	45 (48) 52 (56)	21 (41) 26 (64)					52.3
Excretion	8 (60) 55 (66)	42 (14) 58 (14)					38.5
Reproduction	3 (60) 17 (37) 36 (67)	10 (84) 13 (74)					64.4
Struc.al & Func. Organization	4 (37) 18 (61) 25 (46) 32 (73)	29 (80) 43 (25)					58
Nervous System and Control	23 (75) 37 (41)	30 (48) 56 (61)	46 (18)				48.6
Genetics	14 (69) 31 (65)	33 (73) 39 (30)	20 (46)		44 (35)		53
Variation and Classification	28 (30) 60 (27)	34 (33) 41 (43)	54 (51)		40 (23)		34.5
Ecology	6 (79) 48 (74)	19 (67)	27 (75)		51 (60)		71
Health and Diseases	11 (39)	50 (23)					31
Mean	58	47.2	44.6		38.8		50.9

*Percent correct responses in parenthesis

Table 11 (page 88) presents means of successful responses for each category by topics and the mean of successful responses for each grade level. In addition, the items and the mean percent correct responses for each grade level are reported. Student scores showed general lack of knowledge for all three grades with very low scores for most topics

Table 11

Percent Successful Responses by Topic and Grade Level for the ABAT

Topics	Grade Levels			Mean
	10th	11th	12th	
Cell Biology & Microscope	1 (73)* 5 (27) 16 (47) 24 (71) 35 (48)	7 (67) 9 (56) 53 (25) 59 (18)		48
Nutrition and Digestion	2 (63) 15 (21) 22 (58) 49 (50) 57 (59)		12 (74) 38 (30) 47 (47)	50.3
Respiration	26 (64) 52 (56)		21 (41) 45 (48)	52.3
Excretion	55 (66)		8 (60) 42 (14) 58 (14)	38.5
Reproduction	17 (37)		3 (60) 10 (84) 13 (74) 36 (67)	64.4
Struc.al & Func. & Organization			4 (37) 18 (61) 25 (46) 29 (80) 32 (73) 43 (25)	58
Nervous System and Control	56 (61)		23 (75) 30 (48) 37 (41) 46 (18)	48.6
Genetics	14 (69) 20 (46)	31 (65) 33 (73) 39 (30) 44 (35)		53
Variation and Classification		28 (30) 34 (33) 40 (23) 41 (43) 45 (51) 60 (27)		34.5
Ecology		6 (79) 19 (67) 27 (75) 48 (74) 51 (60)		71
Health and Diseases			11 (39) 50 (23)	31
Mean	58	49	49	50.9

*Percent Correct Responses in parentheses except ecology for grade 11. Possible reasons for the student scores are considered in chapter 4.

Mathematics Achievement Test

Mathematics achievement was measured as one variable of student academic ability. The California Achievement Test, form 19 C (CAT/C), is one of a series of test batteries used for evaluating students' learning and performance. The California Achievement Test (book 19 C) focuses on mathematics computation, concepts, and mathematical applications (CAT Examinar's Manual, 1977).

The California Achievement Test (CAT, book 19 C) was based on The United States curriculum and has been used frequently in American schools. It has been found to be a valid test for the objectives for which it was designed. The researcher obtained permission to translate and use the California Achievement Test in mathematics, book 19 C (Appendix G).

The first Arabic version and the English version were given to Saudi graduate students at The Ohio State University majoring in mathematics and engineering for their review. Their comments and recommendations were considered for the improvement of the translation of the test items.

Test reliability.

The researcher pilot-tested the translated mathematics test in Saudi Arabian secondary schools in the southwestern region of the country. The researcher analyzed the California Achievement Test in mathematics for difficulty and discrimination levels using an item analysis computer program (ITEMA). The results showed that the translated mathematics test had an overall reliability (KR-20) of .68. Item difficulties ranged from .00 to .99 with an average of .70. The point biserial correlation (discrimination indices) ranged from .00 to .80 with a mean of .16. No items were modified on the final version except for translation. Wording was changed to clarify the intent of the original items. The results of the pilot are reported in table 12.

Table 12

Characteristics of the Translated Mathematics Achievement Test (CAT book 19C)

Type of indices	Mean	Range	No. of items
Difficulty indices	.70	.00 - .20	5
		.21 - .40	13
		.41 - .60	14
		.61 - .80	10
		.81 - .99	43
Discrimination indices	.16	below .00	34
		.00 - .20	19
		.21 - .40	14
		.41 - .60	12
		.61 - .80	6
		.81 - .99	0

Test administration.

The translated version of California Achievement Test (Mathematics, book 19 C) was administered to 12th grade science students in the selected schools in the southwestern region of Saudi Arabia. The mathematics test was given to the students by the researcher with the help of school teachers.

Answer sheets for the mathematics test were keyed for computer scoring by the researcher. An SPSS^x program was used to calculate the scores of the test.

Arabic Achievement

Achievement in Arabic was collected as a second variable related to student academic ability.

Secondary students take exams in each subject at the end of each term. Each school developed a test and administered it at the end of the first term of the academic year.

No overall reliability is reported for these tests because they were based on separate school data and each school developed its own test. Schools were required to cover the same curriculum guidelines in each term. The correlations between language scores and other scores were similar for most schools. They were highly significant (P<.0001)

The researcher examined records of sample students and collected the scores for Arabic grammar and literature. Scores were recorded and used as obtained.

Student's Background Information Questionnaire

A Student Background Information Questionnaire was developed by the researcher to collect background information on the students involved in this investigation. This questionnaire included age, nationality, parental education and occupation, number of brothers and sisters and their education, reason for the selection of science division in high school, number of years at the secondary level, and interest in science fields (Appendix C).

Student's Perceptions of Classroom Activities and Student-Teacher Relationships.

The researcher obtained permission to translate the Checklist for Assessment of Science Teachers: Pupil's Perceptions (CAST:PP) into Arabic. CAST:PP was used to assess student-teacher relations and science classroom activities. Brown (1972) reported that CAST:PP had a reliability (KR-20) of .74 with 327 students in the United States. Other studies that have used the CAST reported reliabilities in the same range.

The CAST has ten questions and each question is followed by five choices. Students were expected to select the answer that most closely represented what usually occurred in their classrooms and best described their teachers (Appendix H).

Teacher's Characteristics Questionnaire

The researcher developed a Teacher Background Information Questionniare to collect data about the teacher's characteristics. These characteristics included age, degree, major, years of teaching science, nationality, reason for selecting science teaching profession, number of classes per week, the size of the classes they teach, and teacher opinion toward the availablity of material, facility, equipment, and time for instruction (Appendix E).

Science Classroom Activity Checklist: Teacher's Perceptions (SCACL:TP)

The researcher also obtained permission to translate The Science Classroom Activities Checklist: Teacher Perceptions (SCACL:TP) into Arabic. It was designed to evaluate and measure the appropriateness of classroom activities.

The SCACL is an extention of work done by Kochendorfer and Lee in 1966 at The University of Texas (Brown, 1972). The SCACL was developed, pilot tested, and used at The Ohio State University (Sagness, 1970). Sagness reported the validity, the results of item analysis, reliability, and the process of revision. The SCACL was shown to have a reliability (KR-20) of .75 in The United States. Brown (1972) modified the SCACL by involving personal characteristics of the teachers. The SCACL has 60 statements and teachers were expected to respond with true or false to each statement (Appendix J).

School Information Questionnaire

This questionnaire was developed by the researcher to collect information about the schools. Schools' principals were asked to provide information about their schools. This questionnaire included school size and location, student-teacher ratio, number of science classes, enrollment in science classes, number of students who graduated last year, number of new students at the 10th grade, resources, and type of building (Appendix L).

SECTION FOUR: DATA COLLECTION

For the purpose of this study, the researcher spent almost three months visiting selected educational districts and their schools in the southwestern region of Saudi Arabia to gather needed data from students, science teachers, and schools.

The data collected included the following: (1) biology achievement scores; (2) mathematics achievement scores; (3) Arabic achievement scores (grammar and literature); (4) student background information; (5) student perceptions of classroom activities and student-teacher relationships; (6) background information of science teachers; (7) teacher perceptions of the classroom activities; and (8) school variables.

In April, May , and June of 1988, the researcher visited all secondary schools involved to collect all data needed for this study. All data were collected in the same day from each of these schools.

First, biology achievement scores were collected by administering the Al-Shahrani Biology Achievement Test (ABAT). The ABAT was administered by the researcher to the students in their classes before the end of 1987-1988 academic year. Second, mathematics scores were collected by administering the translated California Achievement Test (CAT/C). The CAT was administered to the students by the researcher.

Third, the researcher collected Arabic achievement scores (grammar and literature) from the student records in their schools. Fourth, student background information was collected by administering the Student Background Information Questionnaire to the students in their classes. Fifth, the researcher administered the Checklist for Assessment of Science Teachers: Pupil's Perceptions (CAST:PP) to the students to collect data about science classroom activities and student-teacher relations as perceived by the students.

Sixth, teacher background and characteristics were collected by administering The Teacher Characteristics Questionnaire to science teachers in their schools. The questionnaires were collected directly from the teachers by the researcher. The

Science Classroom Activity Checklist: Teachers' Perceptions (SCACL:TP) data were the second data collected from teachers. The researcher administered the SCACL to the teachers.

Finally, school-related information was collected by administering a short questionnaire to school principals. The researcher distributed all questionnaires to the selected schools and collected all of them during his trip to Saudi Arabia.

SECTION FIVE: DATA ANALYSIS

Data analysis involved the following procedures: (1) data coding; (2) descriptive analysis; and (3) other statistical analyses including Analyses of Variance (ANOVA), Regression, and Analysis of Covariance (ANCOVA).

Data Coding

Arabic, Biology, and Mathematics Achievement.

Biology, and mathematics achievement scores were obtained by taking individual item responses and adding the correct items to obtain a total score. A SPSS^{x} package was used to do the calculation for both ABAT and Mathematics. Arabic literature and grammar scores were obtained as numbers and they were used as they were collected.

Student's and Teacher's Background Variables.

Student background information such as parental education and occupation were coded dichotomously into categories. For example, in coding parent educational levels, if a student selected secondary school level, then the secondary school category was coded as one and other categories were coded as zeros. Parental occupation was coded in a similar way, one for the selected category and zero for others. Also, students' perceptions of classroom activities (CAST) were used as they were received. For example, if a student selected choice (a), it was coded as one and choice (b) was coded as two.

Teacher variables as well as other variables were coded dichotomously into categories. The Science Classroom Activity Checklist: Teacher Perceptions (SCACL: TP) was coded as one for the true statement and zero for the false statement. Finally, school variables were coded as received, but school size was coded as one for large size school and two for middle size schools.

Descriptive Analysis

The data collected were analyzed by a SPSS^{x} (Version 2.2) computer program available at The Ohio State University's Instruction and Research

Information Center. Descriptive analyses involved two parts. The first part of the descriptive analyses involved finding percentages and frequencies of responses of all variables. The second part involved the production of correlation matrices for all variables. The knowledge of frequency distributions was helpful in determining further analyses to be used. Also, the results of these analysis were used to check the input data and to eliminate some variables.

Variables that had very low frequencies (less than three percent of the total sample) were dropped or combined and renamed. The variables dropped or combined and renamed include the following:

1) Father occupation: category of engineer was deleted and dropped from other analyses.
2) Father education categories of bachelors, masters, and doctoral degrees were combined and renamed as father college education.
3) Mother education categories of bachelors and masters degrees were combined and renamed as mother college education.

The purpose of the running correlational analyses was to help explain the relationships between the variables and to help eliminate some variables.

Analysis of Variance (ANOVA)

Analysis of variance was employed for the purpose of finding any significant differences on biology test among schools.

Regression Analysis

Stepwise multiple regression was used to determine the relationship between a dependent variable or criterion variable (Biology Achievement) and a set of independent or predictor variables.

The Statistical Package for the Social Sciences (SPSS^x) multiple regression subprogram combines standard multiple regression and stepwise procedures in a manner which provides a considerable control over the inclusion of independent variables in regression equations (SPSS^x, 1988).

The advantage of the use of this technique as a descriptive tool was to control for other confounding factors in order to evaluate the contribution of a specific variable or a set of variables. Also, regression analysis was used to select items in running the ANCOVAS.

Analysis of Covariance (ANCOVA)

Analysis of covariance (ANCOVA) was used to determine if, when biology scores were adjusted, any significant differences between schools would remain.

Therefore, a series of analysis of covariance were employed to study the differences between schools and to check for variables related to the differences between schools.

Summary

This chapter presented population and sample of this study, instruments used in assessment, data collection procedures, and data analysis procedures. Chapters which follow contain data and results of the study.

CHAPTER IV

RESULTS

The purpose of this chapter is to report the analysis of the data collected from a selected group of Saudi Arabian secondary schools for males.

The chapter contains six sections. Section one presents frequencies of selected variables to facilitate the presentation of data and the sample characteristics. Section two presents the correlation between variables. The third section presents the results of analysis of variance to study the difference between schools in biology achievement. The fourth section presents the results of multiple regressions. Section five presents the results of analysis of covariance (ANCOVA). Section six relates the data to the hypotheses in Chapter 1.

SECTION ONE: SAMPLE CHARACTERISTICS

Descriptive data related to student background variables, science teachers characteristics, and schools variables are presented in this section.

Student variables analyzed included age, nationality, parental education and occupation, interest in science fields, and years at the secondary school, and achievement scores of the student. Teacher variables analyzed included age, nationality, degree, major, and years of teaching experience. Finally, school variables included the distribution of schools by educational districts, size and enrollment, number of science classes, class size, and the location of the selected schools.

Student Variables

Age.

Table 13 shows that 83 percent of the 12th grade science students were in the 17 to 19 years interval and approximately 17 percent were in the 20 to 22 year interval.

Table 13

Frequency Distribution of Students by Age

Age Intervals	No. of Students	%
17 - 19	757	83.0
20 - 22	150	16.5
More than 23	5	.5
Total	912	100.0

Nationality.

Table 14 presents the distribution of students by nationality. This table shows that of the 912 students who participated in this study, approximately 82 percent were Saudi Arabian nationals; the rest of the sample (about 18 percent) was composed of different Arab nationalities.

Table 14

Frequencies of Students by Nationality

Nationality	No. of Students	%
Saudi Arabians	746	81.8
Non-Saudi Arabians	166	18.2
Total	912	100.0

Father's and mother's education level.

Table 15 and Table 16 (page 105) present the frequency distributions of parents' educational levels. First, Table 15 and Table 16 show that approximately 71 percent of mothers and 25 percent of fathers could not read or write. About 20 percent of the fathers and 8 percent of the mothers had completed only elementary school. About 13 percent of the students' fathers and about 4 percent of their mothers had received a college degree. The percentage of students finishing high school is increasing, so data of parents of younger children should reflect a higher average parental educational level.

Table 15

Frequency Distribution of Father's Education

Category	No. of Students	%
Can not Read or Write	230	25.2
No formal Ed., but Can Read	67	7.4
No formal Ed., but Can Read and Write	161	17.6
Elementary School	187	20.5
Junior High School	79	8.7
Secondary School	67	7.4
College Degree	121	13.2
Total	912	100.00

Table 16

Frequency Distribution of Mother's Education

Category	No. of Students	%
Can not Read or Write	645	70.7
No Formal Ed., but Can Read	67	7.4
No Formal Ed., but Can Read and Write	32	3.5
Elementary School	69	7.6
Junior High School	28	3.1
Secondary School	36	3.9
College Degree	35	3.8
Total	912	100.00

Father's occupation.

Table 17 (page 107) presents the distribution of father's occupations. Data for the mother's occupation were not collected due to the fact that only a small percentage of the women work outside the home. The mother's occupations would be distributed primarily across three fields (education, health, and banking) and would result in percentages too small to use.

Table 17 shows that approximately 19 percent of fathers were employed by the government in other than the educational fields. About 18 percent of the fathers were farmers. Approximately 18 percent of the fathers of the students who participated in the study were businessmen. About 15 percent of fathers were retired or dead. Finally, about 11 percent of the fathers were teachers in public schools.

Table 17

Frequencies of Father's Occupation

Category	No. of Students	%
Businessman	161	17.7
Engineer	9	1.0
Farmer	162	17.8
Work in the Medical Field	33	3.6
Work in the Military	64	7.0
Teacher	101	11.1
Not Working	71	7.8
Governmental Employee	173	18.9
Others	138	15.1
Total	912	100.0

Student interest in science fields.

Table 18 (page 108) presents an analysis of student interest in science fields. The results indicated that the interest in biology and geology were the highest. This table shows that of 912 students who participated in the study, about 54 percent were highly interested in biology and approximately 45 percent were highly interested in geology. About 24 percent of the students had a high interest in chemistry; 25 percent showed high interest in physics. Finally, about 57 percent of the students showed low or no interest in physics and chemistry.

Table 18

Distribution of Frequency of Student Interest in Science Fields

	Interest							
	High		Moderate		Low		None	
	No. of Students	%	No. of Students	%	No.of Students	%	No. of Students	%
Biology	488	53.5	283	31.0	49	5.4	91	10.1
Chemistry	220	24.1	350	38.4	166	18.2	176	19.3
Physics	229	25.1	302	33.1	172	18.9	209	22.9
Geology	407	44.6	247	27.1	106	11.6	152	16.7

Number of years at the secondary level.

Table 19 (page 109) shows that about 72 percent of the students did not repeat any year in the secondary level. However, approximately 24 percent of the students had repeated one year and about four percent had repeated more than one year of the previous grades in the secondary level. Students are not allowed to repeat the same grade more than two years.

Table 19

Frequency Distribution of Number of the Students by the Number of Years in the Secondary School

No. of Years	No. of Students	%
3	662	72.6
4	216	23.7
More than Four Years	34	3.7
Total	912	100.0

Achievement scores.

This part of the analysis presents the descriptive results of The Al-Shahrani Biology Achievement Test (ABAT), Arabic Grammar, Arabic Literature, and Mathematics scores. Table 20 (page 110) shows the results of these exams for all educational districts. The mean of the ABAT scores was 29.7 with a standard deviation of 7.2. Arabic grammar results had a mean of 38.9 with a standard deviation of 7.0. Arabic literature scores resulted in a mean of 41.0 with a standard deviation of 6.2. Finally, mathematics scores had a mean of 52.8 and a standard deviation of 14.5.

The results of the analysis of these exams for the educational districts are presented in Tables 21, 22, 23, 24, and 25 (page 110, 111, and 112). Comparisons of these tables show substantial differences existed between districts.

Table 20

The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for all Districts.

Achievement	Mean	S.D.	No. of Students	Total Possible Score
ABAT	29.690	7.192	912	60
ARABG	38.871	7.027	912	50
ARABL	41.037	6.213	912	50
MATH	52.825	14.532	912	85

ABAT: Al-Shahrani Biology Achievement Test Scores.
ARABG: Arabic Grammar Scores.
ARABL: Arabic Literature Scores.
MATH: Mathematics Achievement Scores.

Table 21

The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Abha Educational District.

Achievement	Mean	S.D.	No. of Students	Total Possible Scores
ABAT	29.444	7.136	295	60
ARABG	37.827	7.090	295	50
ARABL	40.376	5.970	295	50
MATH	49.715	16.420	295	85

Table 22

The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Al-Baha Educational District.

Achievement	Mean	S.D.	No. of Students	Total Possible Score
ABAT	29.476	6.608	225	60
ARABG	37.458	7.623	225	50
ARABL	40.218	7.248	225	50
MATH	49.098	13.422	225	85

Table 23

The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Bisha Educational District.

Achievement	Mean	S.D.	No. of Students	Total Possible Score
ABAT	28.937	7.596	80	60
ARABG	41.537	5.887	80	50
ARABL	40.218	5.092	80	50
MATH	52.700	10.585	80	85

Table 24

The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Jizan Educational District.

Achievement	Mean	S.D.	No. of Students	Total Possible Scores
ABAT	30.797	7.939	177	60
ARABG	38.916	5.724	177	50
ARABL	40.079	5.720	177	50
MATH	54.836	12.236	177	85

Table 25

The Results of Biology, Arabic Grammar and Literature, and Mathematics Tests for Najran Educational District.

Achievement	Mean	S.D.	No. of Students	Total Possible Scores
ABAT	29.578	6.921	135	60
ARABG	41.874	6.763	135	50
ARABL	43.237	4.905	135	50
MATH	63.267	10.976	135	85

Teacher Variables

Age.

Table 26 shows that about 64 percent of the science teachers were in the 30 to 39 year age interval and approximately 20 percent of the teachers were in the 40 to 49 year age interval. Only nine teachers (15 percent) were in the 20 to 29 year age interval. No science teacher in the study was over 50 years of age.

Table 26

Frequency Distribution of Science Teachers by Age

Age Interval	No. of Teachers	%
20 - 29	9	15.3
30 - 39	38	64.4
40 - 49	12	20.3
50 - 59	0	00.0
Total	59	100.0

Nationality.

Table 27 shows that approximately 76 percent of the science teachers who participated in the study were not Saudi Arabian nationals. Only about 24 percent of the teachers were Saudi Arabian nationals.

In the past, many teachers were hired from other countries. In recent years, more Saudi Arabian nationals have prepared to be teachers and are being employed. Hence, these data will probably change in future years (see page 34 for more discussion).

Table 27

Distribution of Science Teachers by Nationality

Nationality	No. of Teachers	%
Saudi Arabian	14	23.7
Non - Saudi Arabian	45	76.3
Total	59	100.0

Degree.

Table 28 (page 115) shows that the majority (about 95 percent) of the science teachers had a bachelor degree. Only about 5 percent of the teachers involved in this study had a masters degree. None of the teachers reported having a doctorate.

Table 28

Frequency Distribution of Teachers by Degree

Degree	No. of Teachers	%
Bachelor	56	94.9
Masters	3	5.1
Doctorate	0	0.0
Total	59	100.0

Majors.

Table 29 (page 116) presents the distribution of teachers by majors. About 46 percent of the teachers had majored in biology. The distribution of physics and chemistry majors was equal; each had about 27 percent. Some teachers indicated that they were required to teach subjects different from their major. For example, physics teachers are sometimes required to teach chemistry. Also, biology teachers are responsible for teaching geology. No teachers were found to have a major in geology or earth science.

Table 29

Frequencies of Science Teachers by Majors

Category	No. of Teachers	%
Biology	27	45.8
Physics	16	27.1
Chemistry	16	27.1
Geology	0	00.0
Total	59	100.0

Teaching experiences.

Table 30 reports the extent of the teachers' experience in teaching science. The majority (76 percent) of these teachers had more than three years of teaching at the secondary school levels. Only 3.4 percent of the science teachers had only one year of teaching experience.

Table 30

Frequency Distribution of Teachers by Years of Teaching Experiences

No. of Years	No. of Teachers	%
One Year	2	3.4
Two Years	8	13.6
Three Years	4	6.8
More than Three Years	45	76.2
Total	59	100.0

School Variables

Number of selected schools.

Table 31 presents the distribution of schools by educational districts. Approximately 41 percent of the schools was selected from the Abha educational district. About 18 percent of schools came from the Al-Baha and about 18 percent from the Jizan educational districts. Approximately 12 percent of the schools were selected from Bisha district and 12 percent from Najran.

Table 31

Frequencies of Schools by Educational Districts

Educ. Districts	No. of Schools	Percent
Abha	7	41.2
Al-Baha	3	17.6
Bisha	2	11.8
Jizan	3	17.6
Najran	2	11.8
Total	17	100.0

School size.

Table 32 shows the distribution of schools by school size and total enrollment in each size category. About 79 percent of student enrollment was in the 11 large size schools involved in this study. Middle-size schools had approximately 21 percent of the total student enrollment.

Table 32

Sample Distribution of Schools and Students by School Size

School Size	No. of Schools	%	No. of Students	%	Average No. of Students
Large	11	64.7	4276	79.4	388.73
Middle	6	35.3	1108	20.6	184.67
Total	17	100.0	5384	100.0	573.40

School location.

Table 33 (page 119) shows the ratio of city schools to suburban or village schools. There were more city schools than suburban and village schools. This distribution showed that cities had a large number of schools (64.7 percent). It should be remembered that small schools with enrollment of 60 students or less were eliminated from this study.

Table 33

Frequency Distribution of Schools by Location

Location	No. of Schools	%
Village	2	11.8
Suburbs	4	23.5
City	11	64.7
Total	17	100.0

Science classes.

Table 34 shows the total number of science classes (11th and 12th grades) in the selected schools. Schools with low enrollment had low numbers of science classes. Larger city schools had higher numbers of science classes; each of the largest three schools had seven science classes.

Table 34

Number of Science Classes (11th and 12th grades) in all Sampled Schools

Dist.	No. of Schools	No. of Science Classes	Average No. of Classes	%
Abha	7	29	4.14	34.9
Al-baha	3	15	5.00	18.1
Bisha	2	8	4.00	9.6
Jizan	3	14	4.67	16.9
Najran	2	17	8.50	20.5
Total	17	83	26.31	100.0

Class size.

Table 35 presents the distribution of science classes (12th grade) by size in the 17 secondary schools involved in this study. Class size of 26-30 students was the most common class size found in this study. The mean class size was 25.5. No classes had more than 35 students.

Table 35

Distribution of Science Class Size in (12th grade) the Selected Schools

Class Size	No. of Classes	%
11 - 15	0	0.0
16 - 20	8	18.2
21 - 25	10	22.7
26 - 30	20	45.5
31 - 35	6	13.6
More than 35	0	0.0
Total	45	100.0

SECTION TWO: CORRELATIONS BETWEEN VARIABLES

Coefficients of correlation between all variables were computed. The correlation materices for all variables are presented in the Appendix O . No correlation tables are presented in this section. Significant correlates with biology achievement are considered in the regression section.

SECTION THREE: RESULTS OF ANALYSIS OF VARIANCE FOR DIFFERENCES IN SCHOOL ACHIEVEMENT ON THE BIOLOGY TEST

One way analysis of variance was used to determine if any significant differences between schools existed. Table 36 (page 123) presents the results of analysis of variance. The results showed that there were significant differences between schools at the .0001 level. The highest mean score was 34.02 and the lowest mean score was 25.31. Most school means clustered between 27 and 32.

SECTION FOUR: RESULTS OF STEPWISE MULTIPLE REGRESSIONS

Since differences existed between schools and between students, multiple regressions were used to determine the variables that accounted for the highest amount of the variance. The purpose of using stepwise multiple regression analysis was to determine the predictive values of student characteristics, teacher characteristics, and school variables to the student biology achievement (dependent variable) at the 12th grade level in the selected Saudi Arabian secondary schools.

Three groups of selected variables were analyzed to predict biology achievement in this part of the country. These variable groups included the following:

1. Student characteristics: (1) student home background variables: parental education and occupation, student science interests; (2) scholastic ability (Arabic literature and grammar achievement means, and mathematics means); and (3) biology mean scores.

2. Teacher variables: age, nationality, degree, major, teaching experience, teaching load per week, teacher perceptions of instruction, and teacher opinion toward teaching and facilities available to them.

3. School variables: educational districts, size of school, number of science classes, size of science classes, location, student-teacher ratio, and school identification code.

Table 36

Analysis of Variance for Schools Differences on the Biology Test

SOURCE	DF	SUM SQUARES	MEAN SQUARE	F	F PROB
Between	16	6144.69	384.04	8.3890	.000
Within	895	40972.49	45.78		
Total	911	47117.18			

SCHOOL	MEAN	STANDARD DEVIATION	STANDARD ERROR
1	27.28	6.87	.89
2	25.31	6.76	.86
3	27.44	5.19	1.29
4	34.02	6.43	.69
5	27.86	6.45	1.41
6	29.87	4.98	.89
7	31.90	5.56	1.24
8	28.01	6.03	.59
9	28.28	5.82	.79
10	32.87	6.99	.87
11	29.97	7.69	1.00
12	26.05	6.65	1.45
13	28.23	8.02	.90
14	33.25	7.61	.90
15	31.85	6.31	1.22
16	30.40	6.79	.69
17	27.63	6.93	1.09

Prediction of Biology Achievement

Correlation results indicated that mathematics achievement had the highest correlation with biology achievement of any predictor variables. To determine if student and teacher characteristics or school variables might account for significant variance after the relationship with mathematics achievement was removed, three regression analyses were run against biology achievement. The first regression analysis was run without school ID involved.

Table 37 (page 125) presents the results of the multiple regression analysis of student and teacher characteristics and school variables against the biology mean score without including school identification numbers (SID's). Student characteristics (mathematics achievement and interest in biology) positively and significantly related to, and accounted for, about 38 percent of variance in biology achievement. Adequacy of materials in the schools was negatively and significantly related to, and accounted for, about 8 percent of the variance in biology achievement.

This was primarily due to two schools in which teachers believed they had less adequate materials, but had higher than average achievement. No other variables accounted for more than one percent of the explained variance.

Table 37

Multiple Regression of Student Characteristics, School Variables, and Teacher Characteristics to Biology Achievement without School ID's.

```
            MULTIPLE R              .68
            R SQUARE                .46
            ADJUSTED R SQUARE       .43
                  ANALYSIS OF VARIANCE
                DF      SUM SQUARES      MEAN SQUARE
 REGRESSION      3        182.57        60.59
 RESIDUAL       55        212.98         3.87
 F = 15.72              SIGNIF F = .0000
                  Variables in the Equation
STEP VARIABLE MULTR RSQ  ADRSQ F(EQN) SIGF RSQCH SIG
 1     MATHM   .57  .33    .32  27.99  .000  .33   +
 2     MATADQ  .64  .41    .39  19.44  .000  .08   -
 3     MINT1   .68  .46    .43  15.72  .000   05   +
```

MATHM: Mathematics Mean score.
MATADQ: Material Adequacy in the Selected Schools
MINT1: Mean Interest in biology.

Table 38 (page 126) presents the results of regression analysis of the 5 high and 5 low schools against biology mean scores. The results show that schools number 4, 14, and 10 had a significant and positive relationships and accounted for about 61 percent of the variance in biology achievement. SID2 and SID12 had a significant and negative relationship and accounted for about 14 percent of the variance in biology achievement. SID7 and SID15 were also positively and significantly related to biology achievement. SID7 and SID15 accounted for about 11 percent of the variance. This analysis indicated that characteristics related to a few schools could be used for further analysis of higher student achievement.

Table 38

Multiple Regression of General School Variables (SID's) to the Biology Achievement.

MULTIPLE R .93
R SQUARE .86
ADJUSTED R SQUARE .84

ANALYSIS OF VARIANCE

	DF	SUM SQUARES	MEAN SQUARE
REGRESSION	7	339.30	48.47
RESIDUAL	51	56.25	1.10

F = 43.95 SIGNIF F = .0000

Variables in the Equation

STEP	VARIABLE	MULTR	RSQ	ADJRSQ	F(EQN)	SIGF	RSQCH	SIG
1	SID4	.55	.31	.29	25.30	.000	.31	+
2	SID14	.68	.46	.44	24.03	.000	.15	+
3	SID10	.78	.61	.59	28.38	.000	.15	+
4	SID2	.83	.68	.66	28.94	.000	.07	-
5	SID12	.87	.75	.73	31.96	.000	.07	-
6	SID7	.89	.80	.78	35.20	.000	.05	+
7	SID15	.93	.86	.84	43.95	.000	.06	+

SID4: School Number 4.
SID14: School number 14.
SID10: School number 10.
SID2: School number 2.
SID12: School number 12.
SID7: School number 7.
SID15: School number 15.

Table 39 (page 130) presents results of the multiple regression of student, teacher, and school variables. School (SID) was used to help determine undelineated variables associated with schools that would predict the biology achievement.

Scholastic ability was the highest predictor of biology achievement. The mathematics mean score remained the number one predictor and accounted for approximately 33 percent of the variance. Arabic also related positively and accounted for two percent of the variance. Students who scored high in mathematics and Arabic tests generally did well in biology.

Interest in biology accounted for 13 percent of the variance and was positively related to achievement. Students with higher interest in biology achieved higher scores.

Some schools (SID4, SID14, SID10, SID7, and SID15) were positively and significantly related to biology achievement. These schools accounted for approximately 47 percent of the variance in biology achievement. SID4, SID10, and SID14 were among the strong predictors of biology achievement.

In these schools, student scholastic ability accounted for part of the variance. For example, mathematics achievement accounted for 14 percent of the variance in SID4. Moreover, there are at least three variable or variable clusters that contributed to the high achievement level in the three top schools after mathematics ability. These variables or variable clusters could include the following:

a. Logical reasoning skills could be one of the variables that contributed to explained variance in biology achievement in these schools. Logical reasoning skills have been found to be related to achievement. Frequently, logical reasoning skills account for 7 to 12 percent of the variance after student scholastic ability is removed in regression (mathematics and language).

b. Effective or successful school variables could be one of these variables or variable clusters that contributed to the explained variance in these three schools. School administration is one of the variables that is frequently related to achievement in effective schools.

High expectations of students and teachers has been found to be one of the common variables related to achievement in effective or successful schools.

Other variables are often identified but the principal (leader) and expectations are nearly always among the significant variables.

c. Curriculum and instructional materials organization and congruence are among the variables accounted for part of the explained variance in these schools. Some of the schools might have had better congruence than others between instructional materials, instruction, and desired outcomes.

These three schools provide an opportunity to identify specific variables associated with the achievement in biology and to modify the variables included in the model presented in Chapter 1 for achievement. The variables identified for biology may also be related to achievement in the other science courses and would provide suggestions for improving learning in these classes also.

SID3 was negatively and significantly related and accounted for about 3 percent of the variance in biology achievement. Due to the fact this accounted for only three percent of the variance and represented one school, no attempt was made to identify the reasons for the explained variance.

The rest of predictors accounted for a small amount of the remaining variance in biology achievement. All variables discussed were found significant and of predictive value at the .05 level or lower.

Table 39

<u>Multiple Regression of Student Characteristics, General School Variables (SID's), and Teacher Characteristics to Biology Achievement</u>.

```
                MULTIPLE R                .99
                R SQUARE                  .98
                ADJUSTED R SQUARE         .98
                        ANALYSIS OF VARIANCE
                    DF         SUM SQUARES        MEAN SQUARE
 REGRESSION          9          398.27             43.29
 RESIDUAL           49            5.88               .12
 F = 360.61                SIGNIF F = .0000
_________________ Variables in the Equation _______
STEP VARIABLE MULTR  RSQ  ADJRSQ  F(EQN)  SIGF  RSQCH  SIG
  1   MATHM    .57   .33   .32    27.99   .000   .33    +
  2   SID4     .71   .50   .48    28.02   .000   .17    +
  3   SID10    .79   .63   .61    31.39   .000   .13    +
  4   SID14    .88   .77   .75    44.10   .000   .13    +
  5   MINT1    .95   .89   .89    91.93   .000   .13    +
  6   SID3     .96   .93   .92   110.94   .000   .03    -
  7   SID7     .98   .95   .94   133.58   .000   .02    +
  8   SID15    .99   .97   .96   173.19   .000   .02    +
  9   MARABG   .99   .99   .98   360.61   .000   .02    +
```

MATHM: Mathematics Mean score.
SID4: School Number 4.
SID10: School number 10.
SID14: School number 14.
MINT1: Interest in biology.
SID3: School number 3.
SID7: School number 7.
SID15: School number 15.
MARABG: Mean Arabic Grammar score.

SECTION FIVE: ANALYSIS OF COVARIANCE USING SPECIFIC STUDENT COVARIATES

Since there were significant differences between schools and several significant predictors of biology achievement were identified, a series of analysis of covariance were run to adjust scores based on the significant variables from the regression analysis to determine whether any differences between schools still existed after the scores were adjusted for these significant variables. Analysis of covariance was performed in several steps.

Step 1: Adjusting for Mathematics

Table 40 (page 132) presents the analysis adjusting for mathematics ability. Significant differences in achievement between schools still existed (Signif F .000).

Table 40

Analysis of Covariance Adjusting For Mathematics Ability

SOURCE	DF	SUM SQUA.	MEAN SQUA.	F	SIGNIF F
WITHIN	894	33585.31	37.57		
REGRESSION	1	7387.18	7387.18	196.64	.000
SCHOOL	16	3873.98	242.12	6.45	.000

OBSERVED AND ADJUSTED MEAN OF ABAT

SCHOOL	OBS. MEAN	ADJ. MEAN
1	27.28	28.72
2	25.31	31.39
3	27.44	27.75
4	34.02	32.29
5	27.87	28.32
6	29.88	28.25
7	31.90	29.38
8	28.01	28.56
9	28.01	30.76
10	32.86	33.13
11	29.97	29.91
12	26.05	26.37
13	28.23	28.08
14	33.25	32.49
15	31.85	31.08
16	30.40	27.22
17	27.63	26.53

Step 2: Adjusting for Mathematics, Arabic Grammar, and Arabic Literature

Table 41 (page 133) presents the analysis adjusting scores for Arabic and mathematics achievement. Significant differences (Signif. F .000) between school still existed. The results indicate that other variables accounted for the remaining significant differences. Also, this result indicates that schools that were highest in Arabic language were not consistently highest in biology achievement.

Table 41

Analysis of Covariance Adjusting for Mathematics and Arabic Language (Grammar and Literature)

SOURCE	DF	SUM SQUA.	MEAN SQUA.	F	SIGNIF F
WITHIN	892	32152.43	36.05		
REGRESSION	3	8820.06	2940.02	81.56	.000
SCHOOL	16	4522.00	282.63	7.84	.000

OBSERVED AND ADJUSTED MEAN OF ABAT

SCHOOL	OBS. MEAN	ADJ. MEAN
1	27.28	29.57
2	25.31	30.69
3	27.44	28.56
4	34.02	32.54
5	27.86	27.94
6	29.87	27.53
7	31.90	29.61
8	28.01	28.82
9	28.28	29.45
10	32.86	34.11
11	29.97	29.05
12	26.05	25.83
13	28.23	27.95
14	33.25	32.89
15	31.85	31.76
16	30.40	26.59
17	27.63	27.33

Step 3: Adjusting for Mathematics and Interest. in biology

Table 42 presents the analysis adjusting achievement for mathematics and student interest in biology. Significant differences (Signif F .000) between schools remained.

Table 42

Analysis of Covariance Adjusting for Mathematics and Interest in Biology

SOURCE	DF	SUM SQUA.	MEAN SQUA.	F	SIGNIF F
WITHIN	889	31744.60	35.71		
REGRESSION	2	9124.63	4562.32	127.77	.000
SCHOOL	16	3906.63	244.16	6.84	.000

OBSERVED AND ADJUSTED MEAN OF ABAT

SCHOOL	OBS. MEAN	ADJ. MEAN
1	27.48	28.74
2	25.34	31.81
3	27.44	27.37
4	34.05	32.50
5	27.86	28.62
6	29.87	28.36
7	31.90	29.33
8	28.01	28.29
9	28.28	30.41
10	32.86	32.88
11	29.97	29.49
12	26.05	27.09
13	28.23	27.98
14	33.25	32.75
15	31.85	30.66
16	30.40	27.12
17	27.63	27.07

An Analysis of Scores on the ABAT

Mean school scores on the biology test ranged from 25 to 34 with an average score of 29.69. The test had 60 possible points, so the average score was less than 50 percent. Very few students (three) had high scores of 50 or above on the test.

There are several possible reasons for the low scores on the ABAT.

First, students had low scores on all topics included in the biology textbooks with the exception of ecology and reproduction topics (for categories and responses see Tables 10 and 11 in Chapter 3). Therefore, the lack of success appears to be related to the general curriculum and instructional materials not to the teacher emphasis.

Second, the analysis of the students' success on the test indicates that student success decreased with complexity in almost all topics included in the textbooks of biology. Since students were not highly successful on introductory items, this result was expected.

Recency of instruction did not improve scores on lower level items. The topic of health and disease was taught at the end of the 12th grade and students did not do well on items related to health and disease. The mean correct response was 31 percent for health and disease.

Variation and classification topics were taught at the 11th grade level. Student were not successful on lower level items and the mean correct response was about 35 percent.

Scores on lower level items related to topics taught at the 10th grade level were also low. Items may not have been learned or grade 10 scores could be due to forgetting (with the exception of ecology).

A possible contribution to the low scores could be a lack of emphasis or insufficient instruction by specific teachers. While lack of teacher emphasis may have contributed to some of the low scores, the pattren of scores (no high school mean scores) suggests curriculum, instructional material, or student incentive problems.

Overall results indicated that the success rate on the knowledge category was 58 (not corrected for guessing). On the comprehension category, the success rate was less than 50 percent. The success rate on higher level items (application and syntheses) was 39 percent. Also, the results showed that topics taught were not retained.

The mean percent of correct responses on higher level items was low. This is not surprising because if the students do not know or understand the concepts (lower scores of lower Bloom categories), they will not be able to use or to apply knwoledge. However, since logical reasoning skills were not assessed, the relative impact of knowledge and reasoning skills could not be determined.

Test scores indicate little gain from one year to another on most topics. The analysis by grade level of the curriculum (textbooks) indicate the topics are not taught in an articulated way either within a year or between years.

SECTION SIX: TESTING OF HYPOTHESES

This section presents the testing of hypotheses stated in Chapter I.

Hypothesis one: There are several significant predictors of grade 12 biology achievement. These predictors will include student characteristics, teacher characteristics, and school variables.

This hypothesis is accepted.

Variables in the Main Regression Equation

There were several significant predictors of student achievement in biology. Student scholastic ability (mathematics and Arabic language) was the strongest predictor of biology achievement. The mathematics mean score was significantly (p<.000) and positively related to biology achievement and accounted for 33 percent of the variance. Arabic mean score accounted for two percent of the variance when entered in the regression with mathematics and was significantly and positively (p<.000) related to biology achievement

Student interest in biology was a significant predictor (p<.000) and accounted for about 13 percent of the variance in biology achievement.

Some schools (SID4, SID10, SID14, SID7, and SID15) were positively and significantly related to biology achievement (p<.000) and accounted for about 47 percent of the variance.

Variables Not in the Regression

The following variables were significantly and positively or negatively related to biology achievement but not in the regression. This means they related to other items that were in the regression.

Father's occupation and mother's education (college level) showed significant and positive relationships with biology achievement (p<.000). Younger students achieved significantly better than older students.

The number of years a student was at the secondary school level (more than 4 years) showed a significant and negative correlation with biology achievement (p <.000).

The interest of teachers in science which led them to select science teaching as profession and low load of teaching were significant (p <.01).

Schools with high enrollments and inner city schools had significant, but weak correlations with biology achievement.

The above variables are those related to items on which students did achieve. Student means, however, were less than half the total possible scores on the test. Hence, problems of the curriculum, instruction, and student incentives probably accounted for close to half of the possible scores on the test. Improving these would probably account for more variance than any of the variables identified in the above discussion.

Hypothesis two: There is a significant difference in grade 12 biology achievement among public secondary schools (for males) in the southwestern region of Saudi Arabia.

Hypothesis two is accepted.

Schools differed significantly in terms of biology achievement (p<.000). Scholastic ability of the student to explained about 35 percent of the differences between these schools. Variables related to school 4, 10, and 14 explained about 50 percent of the variance. Schools (SID2 and SID12) showed a significant and negative relationships with biology achievement.

Hypothesis three: A regression equation can be developed that predicts a significant amount of variance of biology achievement at the 12th grade from the model on page 9. Each of the clusters will contribute significantly to the explanation of the biology achievement scores.

Hypothesis three is accepted.

Scholastic ability of the students was the highest predictor of biology achievement. The mathematics mean scores had a strong relationship with biology achievement and accounted for about 33 percent of the variance. Arabic mean scores also significantly (p<.000) related to biology achievement.

Students' interest in biology positively related and accounted for about 13 percent of the variance in biology achievement.

Some schools had positive and significant relationships ($p<.000$) with biology achievement. Other schools had negative and significant relationship with biology achievement.

The prediction equation related to items that accounted for 50 percent of the biology test scores. Hence, while these variables differentiate between high and low scoring schools, all schools could probably improve biology scores significantly if the curriculum and instructional materials were improved. Greater gains would probably be achieved by improving the curriculum, instructional materials, and student incentives than by any other action.

SUMMARY

This chapter presents the results and findings of the data collected from the southwestern region secondary schools. The results are presented in different sections. The chapter that follows presents the summary of the study and results, conclusions, and recommendations.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purposes of this chapter are to present a summary of the study, conclusions based on data obtained, recommendations derived from this study, and suggestions for further investigations.

SUMMARY OF THE STUDY

The purpose of this investigation was to determine the relationship between biology achievement which was defined as the mean score obtained by 912 12th grade students in the southwestern region of Saudi Arabia, and student characteristics, teacher characteristics, and school variables.

The major efforts were to identify variables related to biology achievement and the strongest predictors of biology achievement at the 12th grade level in Saudi Arabian secondary schools enrolling only males (southwestern region).

Public secondary schools (male) in the

southwestern region of Saudi Arabia were the target population of this investigation. Seventeen secondary schools (enrolling only males) from five educational districts were selected for the study.

Several instruments were used to collect the data for this study. The Al-Shahrani Biology Achievement Test (ABAT) was developed by the researcher and was used to collect biology achievement scores. A translated version of The California Achievement Test (CAT/book 19C) was used to collect mathematics scores. Student and teacher background information were obtained by administering background information questionnaires developed by the researcher.

Students' perceptions of classroom activities and student-teacher relationships information were collected by administering a translated Checklist for Assessment of Science Teachers: Pupil's Perceptions (CAST:PP). Teachers' perceptions of classroom activities were obtained by administering a translated Science Classroom Activities Checklist: Teacher's Perception (SCACL:TP). Finally, school information was obtained directly from the schools by administering a school information questionnaire to the schools' principals.

Data were obtained by the researcher at each of the schools. The researcher administered the instrument on site and collected instruments and responses.

Data were analyzed by several procedures. These procedures included use of frequencies, correlations, analysis of variance, stepwise multiple regression, and analysis of covariance. These analyses were performed by using the programs of the Statistical Package for the Social Studies ($SPSS^x$).

SUMMARY OF FINDINGS

Summary of What Students Did Not Achieve.

Analysis of the biology test indicated that students scored 50 percent or less on all topics, but two (ecology and reproduction) without considering correction for guessing. Mean scores on the biology test ranged from 25 to 34 with an average score of 29.69. The test had 60 possible points, so the average score was less than 50 percent.

Because the test was based on the existing biology curriculum (textbooks) and reflected the emphasis of the textbooks, the intended curriculum was not being achieved (the learned curriculum).

Data indicate lack of achievement by many students in nearly all of the schools. Analysis of the data provides suggestions for some of the problems and solutions to the problems.

The means of the success rate across all topics covered over the high school biology curriculum were similar which suggest that teachers did not emphasize certain topics much more than other teachers.

Data for the 12th grade suggest that biological topics taught at this grade were not taught well because no students attained a high level of achievement on these topics. Scores on the 12th grade topics were about 50 percent of the possible scores. These data indicate a general lack of achievement on most topics. Modifying the curriculum and instructional materials should help improve student achievement. It is also possible that students need to be motivated to learn more of what is presented.

Summary of What Students Achieved

Student characteristics.

Student academic background variables (mathematics and Arabic language) were significantly correlated ($p<.000$) with biology achievement. Student academic background accounted for about 35 percent of the total variance in biology achievement. Mathematics achievement was the best predictor of biology achievement and accounted for about 32 percent of the variance in biology achievement.

Student home background variables (parental education and occupation) had significant relationships to the student's biology achievement. Father's educational level showed significant relationship (p<.01) with student's biology achievement. Mother's educational level was significantly related to biology achievement (p<.000). Father's occupation showed significant relationship with biology achievement (p<.000).

Student interest in science fields had a significant relationship (p<.000) with biology achievement. Interest in biology accounted for 13 percent of the variance related to biology achievement. Student interest accounted for more of the variance in class analyses than in individual analyses indicating having interested and motivated students in a biology class helps the learning of students who are less interested.

Student home background variables, scholastic ability, and interest in biology accounted for over 45 percent of the variance in biology achievement at the 12th grade level in secondary schools enrolling only males in the southwestern region of Saudi Arabia.

Teacher characteristics.

Teacher's interest in science and science teaching were significantly associated with biology achievement (p<.008). The correlations were significant but not strong enough to be included in the variables selected by regression. Lower teacher's load was significantly correlated (p<.02) with students' achievement in biology. Teachers' planning time for instruction was significantly (p<.001) related to the students' achievement in biology.

School variables.

School enrollment was significantly correlated with biology achievement (p<.002). Large-size-schools had a correlation of .096 with biology achievement. Schools with a high number of science classes had a significant correlation with biology achievement (p<.019). Schools that had a high number of students at the 10th grade had significant relationships with student achievement in biology (p<.000) Inner city schools had a correlation of .0593 with biology achievement (p<.04).

Other variables associated with the schools that were not delineated (SID's) accounted for about 50 percent of the variance in biology achievement. SID4, SID10, and SID14 showed to be among the strong predictors of biology achievement. The results indicated that some schools after other variables were removed strongly predicted biology achievement. Each of the three schools accounted for over 13 percent of the variance. These data suggest three additional variables or clusters of variables should emerge from an analyses of these schools. Effective and successful school variables are among those that should be investigated.

CONCLUSIONS

Based on the findings and with the limitations of this investigation, the conclusions, discussions, and the comparisons to the related literature are presented as follows:

The results of the test (ABAT) analysis indicated that students clearly did not master any topic of the curriculum. The data suggest much of what may have been learned at one time was forgotten. Moreover, the low rate of success indicates a lack of emphasis on instruction. The curriculum in biology is not a sequential program; therefore, there are few opportunities for students to learn ideas and use and apply them.

Student Characteristics

Student academic background.

The result indicated that students who performed well on mathematics and Arabic language tests also had higher achievement scores on the biology test.

Students' academic achievement in mathematics accounted for 32 percent of the variance in biology achievement. The findings of this study are consistent with those of Lee (1987) in the Republic of China. She reported that scholastic ability of the Chinese students accounted for 20 t0 30 percent of the variance in science achievement.

The correlation coefficients between biology and Arabic language (grammar and literature) were .25 and .28 respectively (p<.000). The correlation coefficient between biology achievement and mathematics achievement was .45 (p<.000). The relationships between Arabic language scores (grammar and literature) and mathematics scores were significant (p<.000). The correlation coefficients between Arabic mean scores (literature and grammar) and mathematics mean score were .34 and .36 respectively.

These findings were similar to the findings of Lee's study (1987). She reported that the correlation between science and Chinese language ranged from .36 to .50 and the correlation between science and mathematics ranged from .45 to .62.

Moreover, the results of this study were consistent with the findings of Fleming and Malone (1982) for studies in the United States. They found that the mean correlation between science and mathematics achievement was .42 and the correlation between science and language was .41. Kahl (1982) found a mean correlation of .46 between mathematics and science achievement.

Data from this study and others continue to indicate that mathematics and language skills are highly related to science achievement. Students who did not develop good mathematics skills did not obtain good scores on the biology test. Students who had difficulty in secondary schools (repeated courses) had lower scores on the biology tests further indicating that academic achievement depended heavily on good achievement in lower grades.

Academic achievement in mathematics and language in lower grades needs to be the major focus of the school system to help students to be able to achieve in other areas and to be able to progress through school successfuly.

Student home background.

The results of the analysis showed that educational levels of parents had a significant relationship to the student's achievement in biology. Mother's educational level was more significant than father's educational level (p<.000).

Also, parental occupation (father's occupation) had a significant relationship with students achievement (p<.000).

The findings of this investigation are consistent with those of Walker (1976). Walker reported that home background variables accounted for 11 percent of the variance in science achievement. Also, Kahl (1982) stated that socio-economic background accounted for nine percent of the variance in science achievement in a meta-analysis of studies primarily in the United States. Lee (1987) reported that home background accounted for nine to 13 percent of he variance of science achievement in the Republic of China.

Parental variables (home background) clearly related to student achievement. The strongest predictors were educational levels of the parents. This findings indicate the need to continue to expand the school system to reach all children, attempt to keep more students in the school system through high school, and to provide adult literacy programs and adult education programs to increase the educational level of the parents. Increasing the educational level of the parents should result in better biology achievement by their children.

The results of this study also indicated that student's interest in science fields had a significant relationship with biology achievement (p<.000). The correlation between individual student interest in biology and biology achievement accounted for five percent of the variance. Class mean student interest in biology was among the predictors of biology achievement. It accounted for 13 percent of the variance in biology achievement. Classes that had more students interested in biology scored substantially higher than those who had fewer.

This finding is consistent with the findings of Harty et al. (1985). They found a significant correlation (p<.01) between interest in science and science achievement. Wakefield (1988) found that interest in science correlated significantly with science achievement (p<.05).

This finding indicates that schools need to consider student interests and develop programs that develop student interests and also relate to their intersts and needs.

Classes should be organized in a way that students with low and high interests in biology are not placed in separate classes. The data in this study shows that one of the strongest impacts on achievement of students with lower interest is being in the classes with students with higher interest.

Teacher Characteristics

The results of this study showed that students of teachers who were interested in science fields obtained higher achievement than those of teachers who were not interested in science and science teaching. Teacher's interest in science had a correlation of .08 with student's biology achievement (p<.008). Lower load of the teacher had a significant relationship (p<.02) with student's biology achievement (r=.07).

Schools need to encourage students to go into field of science teaching. Also, science teachers need to be given a lower teaching load. The lower load will allow teacher to have more time for successful instructional planning and will allow them to help students who need more help. Teachers of schools that had strong and significant relationships with student's biology achievement had high expectations of their students.

School Variables

School enrollment was significantly correlated to biology achievement (p< .002), but the correlation coefficient was small (r=.096). This finding is consistent with other studies, such as Keeves (1973), Brookover et al. (1979), and Lee (1987).

School location had a significant correlation (p<.04) with biology achievement (r=.06). City schools in Saudi Arabia frequently are the larger schools and also have students from parents who are better educated. In addition, inner city schools usually have stronger administrators and have higher expectations for the students.

Some schools (SID4, SID10, and SID14) had significant correlations with biology achievement. These schools were strong predictors of biology achievement and accounted for 50 percent of the variance on biology achievement.

Three schools were significant predictors of biology achievement. SID4 and SID14 accounted for 17 and 13 percent of the variance respectively. SID10 accounted for 13 percent of the variance in biology achievement.

SID4 pulled out part of the relationship that also relates to SID14 and SID10. SID14 pulled out some relationship that also relates to SID10. SID10, when it appears in the regression, accounts for another relationship.

Therefore, there were at least three different variables or variable clusters that contributed to the higher achievement level in these schools.

There are several possible explanations for this finding. The logical reasoning skills could be the first possible explanation of the high level of achievement in these schools.

A second alternative explanation could be related to effective or successful school variables. The school principal (leader) and teachers' and students' expectations are among effective or successful school variables that have been found to be significantly related to achievement.

The third possible explanation could be related to the organization of the curriculum and instructional material. The congruence between the curriculum and the instructional materials has been found to be related to students' achievement.

RECOMMENDATIONS

On the basis of findings, observations, and conclusions of the present study, the following recommendations are proposed for further research and improvement.

At the National Level

The curriculum is not functioning effectively. There is strong evidence that the problem is not school specific, but is a problem for nearly all schools.

1. The ABAT should be analyzed to determine that it accurately reflects the emphasis of the three textbooks. It should be modified based on this analysis.
2. The revised ABAT should be given to:
    a. A sample of 10th, 11th, and 12th grade students at the end of the next academic year in the same schools to assess learning by years.
    b. A sample of 12th grade students in each of the other regions of Saudi Arabia should be tested to compare results.
3. If data from the above studies are similar to the data obtained in this study, then the curriculum should be analyzed to determine what

Saudi Arabia desires to have for the intended curriculum (content, logical reasoning skills, sequence, and emphasis).

4. After completing three above, the instructional materials should be analyzed to determine that they are congruent with the intended curriculum. If not, they should be rewritten to assure that they are congruent.
5. After four above is completed, teachers should receive inservice instructions in the use of the materials to be certain that instruction is congruent with the curriculum.
6. A test item bank should be developed for each year of the curriculum to provide congruent evaluation instruments so that the assessment stresses the goals of the curriculum and so that the evaluation data obtained allows monitoring of the effectiveness of the materials and instructions in achieving the curriculum.
7. The data obtained in this study indicated that there is not a three-year sequential biology curriculum. The organization of the curriculum needs to be improved by providing sequential and hierarchial experiences so that students

can learn and then apply and use this information. The biology textbooks need to be rewritten to reflect a sequential and hierarchial curriculum.

8. Data supported the importance of the quality of education for both school age students and their parents. The results of this study showed that a high percentage of parents can not read or write. Therefore, The Ministry of Education needs to work with colleges of education to offer more adult programs and improve adult education programs which are offered mostly for people above the school age.

   Parents should be encouraged to enroll in these programs. This would help them to improve their children' learning and performance. Teachers who are involved in teaching these programs should be well trained in adult education.

9. There is a great need for analyzing and improving the present science teaching. The improvement of science teaching requires analyzing the congruence among the goals of science curriculum, instruction involved, instructional materials, and evaluation. The

data obtained in this study indicate a lack of congruence. Several studies are recommended.

a) The Department of Testing in the Ministry of Education should examine the congruence between the tests used and the science curriculum at the secondary level. This could be accomplished by analyzing the textbooks used in schools and analyzing science test items. A table of specifications should be developed, and test items should be selected or developed based on the table of specification. If the items are based on the curriculum analysis, then there will be a congruence between the curriculum and evaluation.

b) The Ministry of Education should conduct a study to investigate the congruence between tests and instruction. The tests should be given to teachers to rank the emphasis on test items as high, average, and low. The teacher ranking of the emphasis in their classes will help to determine what teachers actually teach. The congruence between instruction and tests should also be checked by observing a sample of teachers.

c) The Department of Testing in the Ministry of Education should study the student achievement at different grade levels, such as grade 3, 6, 9, and 12, to monitor success and to provide feedback for instruction and curriculum.

At the District Level

Several actions are recommended at the educational district level.

1. The low success rate of the students appears to be related to lack of emphasis on instruction and curriculum. Therefore, teachers should be assisted in providing instruction to help build conceptual learning and in the effective use of information. This could be accomplished through providing inservice programs at the district level for science teachers.

   Since average biology scores did not differ significantly among districts, this recommendation applies to all the districts included in this study.

2. Educational districts should cooperate with colleges and universities to develop and to

provide effective adult education programs for above school age people.

3. Similar studies as this one should be conducted involving other sciences such as chemistry and physics.

   This investigation focused on the relationship between student characteristics, teacher characteristics, and school variables and biology achievement at the 12th grade level. Other studies are needed to study the relationships between these variables and other variables remaining to be identified and achievement in chemistry and physics. The results of these studies will help to determine what are the best predictors of chemistry and physics achievements and compare these predictors to those that predict biology achievement. Moreover, these studies will help the schools and the nation to focus on actions to improve achievement.

4. Similar studies are needed to be conducted at the junior high school level and at the elementary school level for males and females in different school locations (city, suburban, and village) to provide more useful knowledge

and information about science education in Saudi Arabian Schools. The results of these studies will be helpful in determining the consistency of academic background and interest in science fields across the three levels of pre-college education.

At the School Level

1. Schools should assess students' learning more frequently to determine what students are learning and modify the curriculum and instruction to avoid the problems identified.
2. School administrators and teachers should consider the findings of this study and other similar studies to insure and exhaust all ways for students' success in science. This could be accomplished by emphasizing the variables that were significant predictors of biology achievement.

   Mastery of mathematics and Arabic language should be emphasized in the curriculum. Interest in science should be increased throughout all secondary schools. Any change in the goals or objectives of the curriculum should involve changes in the instruction. These changes will require strong inservice programs.

3. Effectiveness of schools should be assessed at the school level. The progress or success of any educational project should not be assessed at the educational district level.
4. School staff and parents should help low achieving students and promote and encourage high achievers to continue their progress as early as possible. This process requires a strong relationship and cooperation between schools and parents. Schools should provide programs to assist low achievers to master essential concepts and maintain grade level achievement.
5. Another study should be conducted to study the top three schools (SID4, SID10, and SID14) in the region. This study should investigate the following:
    a. Major variables related to effective and successful schools not included in this study. Among the variables that should be considered are:
        1) expectations of both teachers and students.
        2) The belief that parental cooperation

with schools makes a difference in achievement.

3) The role of school principals in instruction.

4) The organizations of the curriculum and instructional materials.

5) School environment.

6. This study should be replicated and collect additional information (effective school variables) in female secondary and intermediate schools. Involving schools for girls will provide additional information about science education programs and will allow comparisons with schools for boys.

Other Considerations

1. Additional studies should be conducted in the same region and other regions involving variables such as scholastic ability of the students, student interest in science fields, parental education and occupation, and variables related to effective and successful schools; the involvement of these variables will help to ascertain whether the findings can be generalized to a larger population of students in Saudi Arabian secondary schools.

Also, the replication of this study and other similar studies involving the top three schools found in this study will help to lend further support of variables which show significance in this study.

Other variables related to students, teachers, and schools that were not included in this study but which are reported to be related to effective schools should be included. These variables include students' prior knowledge, learning style, expectations, teacher knowledge, teaching practice, expectations, teaching style, and parental cooperation. School variables should include school administration, school environment, and the organization of curriculum and instructional materials.

If these variables are found to be consistently significant predictors of biology achievement, then more attention should be given to them for improving student achievement. If they are found to be inconsistent, they should be considered for investigation.

Appendix A

The Al-Shahrani Biology Achievement Test (ABAT)

English Version

Dear Student:

Please answer all questions. For your information, this test does not have any thing to do with your final grades. The purpose of this test is to collect data for my graduate research.

Please make no marks on the test. Write your answers on the answer sheet as in the following example.

Example:

70. The color of the chlorophyll is

(1) blue.
(2) red.
(3) green.
(4) orange
(5) brown

In the answer sheet, you will find space for each question, select the right choice and mark in the answer sheet.

The right answer for this example is " 3 ". Mark your answer on the box under number 3.

	1	2	3	4	5
70.	☐	☐	✓	☐	☐

1. In plant cells, cellulose is the major constituent of the

(1) cytoplasm.
(2) plastids.
(3) nucleus.
(4) cell wall.
(5) plasma membrane.

2. In the process of photosynthesis, which is NOT required to produce organic food?

(1) water.
(2) sunlight (energy .
(3) carbon dioxide.
(4) oxygen.
(5) chlorophyll.

3. Vegetative reproduction is a type of

(1) sexual reproduction.
(2) asexual reproduction.
(3) simple fission.
(4) budding.
(5) sporulation.

4. The function(s) of the digestive system in animals include(s)

(1) mechanical digestion and regulation of body water content.
(2) chemical digestion and excretion of salts of heavy metals.
(3) absorption of digsted food and egestion of undigested food.
(4) all the above.
(5) two of the above.

5. The cell theory wasfirst hypothesized by

(1) Hook and Schleide.
(2) Schwann and Schleden.
(3) Hook and Schwann.
(4) Schleiden only.
(5) Leeuwenhock.

6. Parasitism is a sitation in which two species

(1) live in intimate ssociation with benefit to both species.

(2) live in intimate association with benefit to one species and the other is neither benefited nor harmed.
(3) live in intimate association with one species benefited and the other harmed.
(4) are working hard to obtain the food from the same environment.
(5) are living in the same environment but there is no relationships between them.

7. Which of the following lens combinations would give a compound microscope the greatest resolving power?

(1) 10X eyepiece; 40X objective.
(2) 8X eyepiece; 25X objective.
(3) 10X eyepiece; 10X objective.
(4) 8X eyepiece; 10X objective.
(5) 10X eyepiece; 35X objective.

8. Animals excrete different types of nitrogenic substances and water. Which of the following excreted substances is the most poisonous to the cells of the body?

(1) uric acid.
(2) water.
(3) urea.
(4) ammonia (NH3)
(5) carbon dioxide.

9. The diffusion of water through a differentially permeable membrane from a region of higher diffusion pressure of water to one of lower diffusion pressure of water is known as

(1) diffusion.
(2) plasmolysis.
(3) phygocytosis.
(4) osmosis.
(5) active transport.

10. From the following patterns of reproduction, which is the most common in the animal kingdom?

(1) budding.
(2) sexual.
(3) sporulation.
(4) asexual.
(5) vegetative.

11. Which of the following human diseases is caused by bacteria?

(1) malaria.
(2) pneumonia.
(3) smallpox.
(4) rabies.
(5) influenza.

12. In the human digestive system, the structure that secretes the digestive juices and hormones such as glycogen and insulin is known as the

(1) spleen.
(2) stomach.
(3) pancreas.
(4) liver.
(5) small intestine.

13. Some higher plants reproduce through the process of vegetative reproduction. Which of the following structures is NOT necessary for this process?

(1) stems.
(2) roots.
(3) leaves.
(4) seeds.
(5) corks.

14. DNA is a(an)

(1) nucleic acid.
(2) amino acid.
(3) acetic acid.
(4) pyruvic acid.
(5) hydrochloric acid.

15. The role of chlorophyll in photosynthesis is similar to the role of

(1) oxygen in respiration.
(2) sugar in respiration.
(3) enzyme in digestion.
(4) plasma in the blood.
(5) two of the above.

16. Your biology teacher provides you with a microscope and two types of cells on slides and asks you to identify them as plant or animal cells. They could be difinitely identified as plant cells and not animal cells if they have

(1) nucleus.
(2) cytoplasm.
(3) cell wall.
(4) vacuoles.
(5) chromosomes.

17. In animals, the process of meiosis occurs

(1) during the production of gametes.
(2) during the formation of the blood cells.
(3) directly after the egg is fertilized.
(4) during the formation of specialized organs.
(5) during the development of the liver.

18. A group of plant or animal cells of a like structure and origin performing a similar function is known as

(1) a system.
(2) an organism.
(3) an organ.
(4) a tissue.
(5) aggregated cells.

19. The relationships between a flea and a cat is known as

(1) competition.
(2) symbiosis.
(3) predation.
(4) parasitism
(5) saprophitism.

20. In the house fly, the medium size (M) is dominant to small (m) size. Two medium size flies are bred with each other and produced 189 medium size (M) flies and 62 small size (m) flies. The parents were

(1) MM x MM.
(2) mm x mm.
(3) MM x mm.
(4) Mm x Mm.
(5) Mm x mm.

21. In the human body, different systems have different functions. Which of the following is NOT a function of the respiratory system?

(1) maintaining water balance of the body.
(2) securing oxygen for the organism.
(3) regulating the body temperature.
(4) secreting the carbon dioxide out of the body.
(5) distributing the nutrients to the cells.

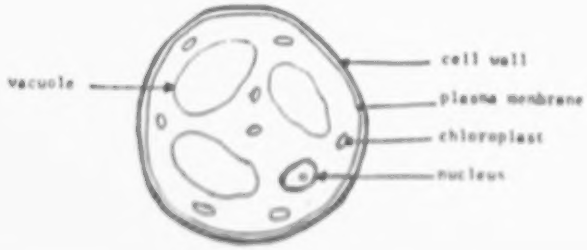
22. There are some similarities among the end products of digestion. From the following, which statement presents the best analysis of these similarities?

(1) the products have very small molecules but are essentially insoluble in water.
(2) the products have large molecules which can be utilized by the cell to build the cell structure.
(3) the products have small molecules and can be used by the cell to produce energy.
(4) the products have large molecules which are insoluble in water but are used by plants.
(5) the products have small molecules and can not be used directly by the cells to produce energy.

23. Which of the following is a plant hormone?

(1) Thyroxin.
(2) Auxin.
(3) Insulin.
(4) Progesterone.
(5) Cortisone.

24. Which of the following statements applies to the diagram?



(1) it is a diagrammatic representation of an animal cell.
(2) it is a diagrammatic representation of a plant cell.
(3) the diagram represents a cross section in a plant root.
(4) the diagram represents a cross section in a plant stem.
(5) the diagram represents a drawing of cork cells.

25. The relationships between cells and tissues is similar to the relationships between

(1) endoderm and ectoderm.
(2) organs and systems.
(3) liver and gall bladder.
(4) white and red blood cells.
(5) mitochonderia and a cell.

26. Which of the following statements about plants is true?

(1) plants respire primarily through the stem.
(2) respiration process occurs only in the presence of day light.
(3) both respiration and photosynthesis occur during night.
(4) respiration in plants produces carbon dioxide and oxygen.
(5) respiration occurs both during day light and night.

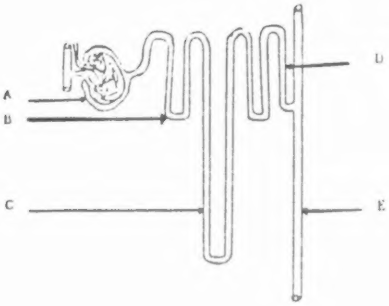
27. Animals that kill and feed only on other animals are called

(1) saprophytes.
(2) herbivores.
(3) carnivores.
(4) symbionts.
(5) omnivores.

28. The scientific name of any living organism must be written in the following order

(1) species, genus.
(2) genus, species.
(3) genus, family.
(4) species, family.
(5) species, order.

29. Based on this diagram, the loop of Henle is labeled



(1) A
(2) B
(3) C
(4) D
(5) E

30. When a man took a medicine without the prescription from his physician, the lymph circulation is stopped. Which of the following processes would be most directly effected?

(1) production of white and red blood cells.
(2) the transport between the blood and the body cells.
(3) the digestion of carbohydrates.
(4) the digestion of proteins.
(5) circulation of the blood.

31. Mutations are

(1) changes that take place in the genetic material in the cell that affect heredity.
(2) changes in the genetic material which destroy the cells.
(3) changes in the cell structure at a specific stage in the cell cycle.
(4) Changes that takes place in the body of an individual due to hot weather.
(5) Two of the above.

32. The function(s) of human skeleton is (are) to

(1) protect the internal organ.
(2) serve for attachment of muscles. (Anchor muscles)
(3) support the structure for the whole body.
(4) all the above .
(5) none of the above.

33. The difference between an albino rabbit and a black rabbit is that the albino rabbit

(1) was raised in a dark room.
(2) can produce specific enzyme used in pigment formation reaction.
(3) has different cell structure.
(4) can not manufacture melanine.
(5) can not live more than two months.

34. The characteristics defining an " order" in classification of organisms are more general than those defining

(1) a species.
(2) a class.
(3) a genus.
(4) 1 and 3.
(5) 1 and 2.

35. An amoeba has a flexible cell membrane but not a cell wall. This statement represents

(1) characteristics of a plant cell.
(2) characteristics of an animal cell.
(3) characteristics of both plant and animal cells.
(4) characteristics of neither plant nor animal cells.
(5) none of the above.

36. The process in which unicellular organisms divide into two daughter cells identical to the original cell is known as

(1) sporulation.
(2) fragmentation.
(3) meosis.
(4) fission.
(5) mitosis.

37. The major function of the thyroid gland is to

(1) regulate the body temperature.
(2) regulate metabolism.
(3) regulate blood pressure.
(4) regulate blood calcium.
(5) regulate respiration.

38. If the pancreatic ducts of a rabbit are tied off

(1) the rabbit will act and behave strangely.
(2) the digestion of carbohydrates will stop and fat will be digested very quickly.
(3) the temperature and the blood pressure of the animal will increase.
(4) the digestion of fat is slowed, but there is no effect on the digestion of carbohydrates and protein.
(5) the digestion of protein and carbohydrates is slowed and the fats are not digested.

39. Which of the following processes may account for the appearance of the first seedless oranges?

(1) mutation.
(2) cross-breeding.
(3) natural selection.
(4) self-pollination.
(5) two of the above.

40. How does cell structure of bacteria compare to that of algae?

(1) bacteria have no nuclear membrane, while algae have a nucleus with a nuclear membrane and genetic material inside the nucleus.
(2) both bacteria and algae have a nucleus with no nuclear membrane and genetic material in the cytoplasm.
(3) both bacteria and algae have a nucleus with a nuclear membrane and genetic material inside the nucleus.
(4) bacteria have plastids and Golgi apparatus while algae does not have these structures.
(5) bacteria have a nucleolus while algae do not have this structure.

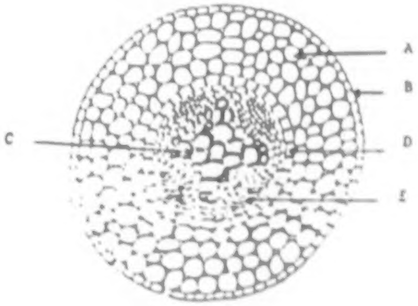
41. The scientific name of a lion is Felis leo. The term "leo" represents

(1) genus.
(2) class.
(3) species.
(4) family.
(5) order.

42. If the process of deamination in a man has increased, what will occur first?

(1) an increase in ammonia.
(2) a decrease in the level of water in the body.
(3) cell poisoning.
(4) 1 and 3.
(5) none of the above.

43. Based on the diagram, Phloem is labled



(1) B
(2) D
(3) A
(4) E
(5) C

44. DNA and RNA work together in all organisms, but some viruses have RNA only. These viruses

(1) can not survive.
(2) have no hereditary information.
(3) have RNA which transmits heredity information.
(4) can live and reproduce only outside the host cells.
(5) do not have RNA that transmits hereditary information to the viruses.

45. The movement of gases such as oxygen and carbon dioxide between the air and the blood in the lungs is called

(1) a cellular respiration.
(2) an external respiration.
(3) anaerobic respiration.
(4) breathing.
(5) none of the above.

46. A thirty-five year old man has attained a height of only 95 centimeters (38 inches). Unlike a midget, he has very low sexual and mental abilities. This condition is a result of under secretion from the

(1) pitutary gland.
(2) parathroid gland.
(3) thyroid gland.
(4) islets of Langerhans.
(5) adrenal gland.

47. In the laboratory, a biology teacher pours some diluted pancreatic juice in a beaker containing starch and ground peanuts. The mixture is studied the next day. As a result, four of the following products are likely to be present; which one is NOT ?

(1) glycose.
(2) glycerol.
(3) fatty acids.
(4) amino acids.
(5) hydrocloric acid.

48. In certain regions, sheep are eaten by wolves. The principle food in the diet of the sheep is green plants. What is the food chain in this situation?

(1) producer, green plants: first order consumer, wolves: second order consumer, sheep.
(2) producer, green plants: first order consumer, sheep: second order consumer, wolves.
(3) producer, Sheep: first order consumer, green plants: Second order consumer, Wolves.
(4) producer, wolves: first order consumer, green plants: second order consumer, sheep.
(5) producer, green plants: first order consumer, wolves: second order consumer, green plants

and sheep.

49. What is the structure in plants that has the same function of the blood arteries in a man?

(1) xylem.
(2) stomata.
(3) phloem.
(4) stone cells.
(5) cork.

50. The major difference between passive and active immunity is that the passive immunity

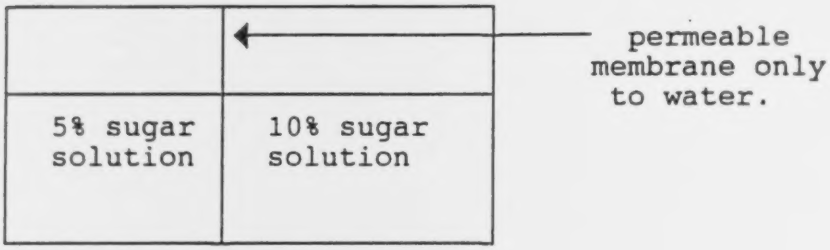
(1) requires more time to be developed by the body.
(2) is considered to be permanent.
(3) requires vaccination with dead or weakened bacteria or viruses.
(4) is immediately acquired by injection of antibodies from other animals.
(5) introduces antigens to the human blood.

51. What animals would typically be found in an area having very high temperature, very little rainfall, and few trees?

(1) frogs, pigeons, ducks.
(2) fox, snakes, rats.
(3) baboons, lions, cats.
(4) rabbits, geese, horses.
(5) 2 and 3.

52. Green plants give off carbon dioxide as a result of
(1) transpiration.
(2) photosynthesis.
(3) respiration.
(4) manufacturing of cellulose.
(5) conduction of water.

53. In a chemical plant, a closed room is divided into right and left halves by a membrane which is permeable to water molecules only but not to sugar molecules. The left part of the room is partially filled by 5% sugar solution and the right half is filled up to the same level by 10% sugar solution.



Select the most correct item that explains what happens.

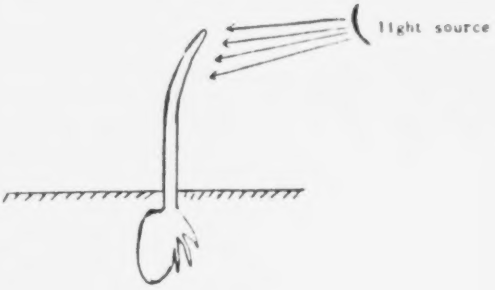
(1) water moves across the membrane and only toward the left into the 5% solution.
(2) the sugar moves across the membrane in both directions.
(3) the water moves across the membrane equally in both direction.
(4) the temperature would determine the amount of water moved.
(5) the water will move a cross the membrane only toward the right.

54. Based on the present system of classification, which of the following organisms is least like the other four?

(1) a lizard.
(2) an alligator.
(3) a snake.
(4) a salamander.
(5) a turtle.

55. Which of the following is an organ?
(1) white blood cells.
(2) an excretion system.
(3) a kidney
(4) blood plasma.
(5) red blood cells.

56. In this diagram, the seedling is bent toward the light as a result of



(1) the movement of the growth hormone to the side facing the light which helps enlongate the plant cells.
(2) the movement of the growth hormone to the side opposite the light which helps enlongate cells in that area.
(3) equal concentration of the growth hormone in both sides of the seedling.
(4) the movement of growth hormone to the root when the plant is exposed to the light.
(5) The increase in the amount of growth hormone in the seedling.

57. Different conditions contribute to the process of lifting water in plants, which of the following contributes the most to water transporation?

(1) age of the plant.
(2) elevation above the sea level.
(3) counter current pressure in phloem cells.
(4) cohesion of water molecules.
(5) root pressure.

58. At a normal temperature and humidity, increased water intake by people is eliminated from the body mainly by

(1) kidneys and lungs.
(2) kidneys.
(3) skin.
(4) the small intestine and skin.
(5) both large and small intestine.

59. Your biology teacher places blood cells on a glass slide and dilutes them with water. When you examine them under the microscope, you notice that the cells seem to explode. This result is probably due to the use of

(1) salty water.
(2) distilled water.
(3) glass slides.
(4) few blood cells.
(5) blood cells in the air.

60. Which of the following phyla has paired appendages?

(1) Mollusca.
(2) Segmented worm.
(3) Arthropoda.
(4) Echinodermata.
(5) Flatworm.

Appendix B

The Al-Shahrani Biology Achievement Test (ABAT)

Arabic Version. A translation of the English Version

بسم الله الرحمن الرحيم

عزيزى الطالب / المحترم

السلام عليكم ورحمة الله وبركاته وبعد : . . .

أخى الطالب الرجاء الاجابه على هذه الاسئله بكل صدق ولعلمك أن هذه الاسئله ليس لها علاقه بدرجاتك وانما الهدف من هذه الاسئله هو اكمال دراستى العليا .

الرجاء عدم الكتابه على ورقة الاسئلة وانما الاجابه تكتب فى ورقة الاجابه فقط وتكتب الاجابه كما فى المثال التالى :- .

مثال :

٧٠ - فى النباتات يكون لون الكلوروفيل .

١ - أزرق

٢ - احمر

٣ - اخضر

٤ - برتقالى

٥ - بنى

وفى ورقة الاجابه تجد لكل سؤال فراغات . ضع علامه فى الاماكن الصحيحه كما يلى :-

اجابة المثال رقم " ٣ "

	١	٢	٣	٤	٥
٧٠ -	☐	☐	☑	☐	☐

١) تعتبر مادة السليلوز فى الخلايا النباتيه العنصر الاساسى لتركيب :-

١ - السيتوبلازم

٢ - البلاستيدات

٣ - النواه

٤ - الجدار الخلوى

٥ - غشاء البلازما

---

٢) ماهو العنصر الغير متطلب فى عملية البناء الضوئي وانتاج المواد العضويه

١ - الماء

٢ - ضوء الشمس (الطاقه)

٣ - ثانى اكسيد الكربون

٤ - الاوكسجين .

٥ - الكلوروفيل .

---

٣) يعتبر التكاثر الخضرى من .

١ - التكاثر الجنسى

٢ - التكاثر الغير جنسى

٣ - التكاثر بالانشطار

٤ - التكاثر بالتبرعم

٥ - التكاثر بتكوين الابواغ

---

٤) من أهم وظيفة (وظائف) الجهاز الهضمى فى الحيوان .

١ - الهضم الميكانيكى وتنظيم محتوى الماء فى الجسم .

٢ - الهضم الكيميائى واخراج املاح المعادن الثقيلة من الجسم .

٣ - امتصاص الغذاء المهضوم والتخلص من الغذاء الغير مهضوم .

٤ - جميع ماذكر اعلاه .

٥ - اثنان فقط مما ذكر اعلاه .

---

٥) اول من افترض نظرية الخليه هو .

١ - هوك وشليدن

٢ - شوان وشليدن

٣ - هوك وشوان

٤ - شليدن فقط .

٥ - ليوفينهوك .

---

٦) يعرف التطفل بأنه الظاهرة عند ما يكون هناك نوعان من الكائنات الحيه

١ - يعيشان متكافلان وفيه يستفيد كلا النوعين .

٢ - يعيشان متكافلان وفيه يستفيد النوع الاول والنوع الثانى لا يستفيد ولا يتضرر

٣ - يعيشان متكافلان وفيه يستفيد النوع الاول ويتضرر النوع الثانى .

٤ - يعملان بشده للحصول على الغذاء من نفس البيئه .

٥ - يعيشان فى نفس البيئه ولكن لا علاقه بينهما .

---

٧) من التراكيب المختلفه للعدسات فى المجهر، ماهو التركيب الذى سوف يعطى اكبر قوة تكبير مما يلى .

١ - العدسه العينيه (١٠) والعدسه الشيئيه (٤٠)

٢ - " " (٨) " " (٢٥)

٣ - " " (١٠) " " (١٠)

٤ - " " (٨) " " (١٠)

٥ - " " (١٠) " " (٢٥)

---

٨) تتلخص الحيوانات من المركبات النتروجينيه والماء . من المواد التاليه وماهى المادة الاكثر سميه لخلايا الجسم .

١ - حامض اليوريك .

٢ - الماء .

٣ - اليوريا .

٤ - الامونيا .

٥ - ثانى اكسيد الكربون .

---

٩) تعرف ظاهرة انتشار الماء من خلال غشاء شبه منفذ من منطقة ذات ضغط مائي مرتفع الى منطقة ذات ضغط مائي منخفض بـ

١ - الانتشار

٤ - شليدن فقط .
٥ - ليوفنهوك .

---

٦) يعرف التطفل بأنه الظاهرة عند ما يكون هناك نوعان من الكائنات الحيه
١ - يعيشان متكافلان وفيه يستفيد كلا النوعين .
٢ - يعيشان متكافلان وفيه يستفيد النوع الاول والنوع الثانى لا يستفيد ولا يتضرر
٣ - يعيشان متكافلان وفيه يستفيد النوع الاول ويتضرر النوع الثانى .
٤ - يعملان بشده للحصول على الغذاء من نفس البيئه .
٥ - يعيشان فى نفس البيئه ولكن لاعلاقه بينهما .

---

٧) من التراكيب المختلفه للعدسات فى المجهر، ماهو التركيب الذى سوف يعطى اكبر قوة تكبير مما يلي .
١ - العدسه العينيه (١٠) والعدسه الشيئيه (٤٠)
٢ - " " (٨) " " (٢٥)
٣ - " " (١٠) " " (١٠)
٤ - " " (٨) " " (١٠)
٥ - " " (١٠) " " (٣٥)

---

٨) تتلخص الحيوانات من المركبات النتروجينيه والماء . من المواد التاليه وماهى المادة الاكثر سميه لخلايا الجسم .
١ - حامض اليوريك .
٢ - الماء .
٣ - اليوريا .
٤ - الامونيا .
٥ - ثانى اكسيد الكربون .

---

٩) تعرف ظاهرة انتشار الماء من خلال غشاء شبه منفذ من منطقة ذات ضغط مائي مرتفع الى منطقة ذات ضغط مائي منخفض بـ
١ - الانتشار

٢ ـ البلزمه
٣ ـ البلعمه
٤ ـ الخاصه الاسموزيه .
٥ ـ النقل النشط

١٠) من انواع التكاثر التاليه ، ماهو نوع التكاثر السائد فى المملكة الحيوانية .
١ ـ التكاثر بالتبرعم .
٢ ـ التكاثر الجنسى
٣ ـ التكاثر بالابواغ
٤ ـ التكاثر اللاجنسى
٥ ـ التكاثر الخضرى

١١) ماهو المرض الذى تسببه البكتريا من الامراض التاليه :-
١ ـ الملاريا
٢ ـ الالتهاب الرئوى
٣ ـ الجدرى
٤ ـ الانفلونزا
٥ ـ داء الكلب

١٢) يعرف التركيب الذى يفرز العصارات الهاضمه والهرمونات مثل الجلكوجين والانسولين بـ
١ ـ الطحال
٢ ـ المعده
٣ ـ البنكرياس
٤ ـ الكبد
٥ ـ الامعاء الدقيقه

١٣) تتكاثر بعض النباتات الراقيه بواسطة التكاثر الخضرى. من التراكيب التاليه الجزء او التركيب الغير ضرورى لهذا النوع من التكاثر هو :-
١ ـ السيقان

٢ - اثناء تكوين خلايا الدم .
٣ - مباشرة بعد اخصاب البويضه .
٤ - اثناء تكوين الاعضاء
٥ - اثناء تكوين الكبد

---

١٨) تعرف مجموعة من الخلايا النباتيه او الحيوانيه المتشابهه فى التركيب والاصل والوظيفة بـ

١ - الجهاز
٢ - الكائن
٣ - العضو
٤ - النسيج
٥ - خلايا متجمعه .

---

١٩) تعرف العلاقة بين البراغيث والقطط بـ

١ - التنافس
٢ - التكافل
٣ - الافتراس
٤ - التطفل
٥ - الترمم

---

٢٠) اذا كان الحجم المتوسط (M) فى الذبابه المنزلية هو الحجم السائد على الحجم الصغير (m) واذا تزاوج اثنتان من الحجم المتوسط وانتجوا ١٨٩ ذبابه من الحجم المتوسط (M) و٦٢ ذبابه من الحجم (m) فان التزاوج حصل بين :-

١ - M M × M M
٢ - m m × m m
٣ - m m × M M
٤ - M m × M m
٥ - m m × M m

٢١) هناك اجهزة مختلفه فى جسم الانسان وكل جهاز له وظيفه أو وظائف مختلفه [illegible] .

١ - المحافظه على مستوى الماء فى الجسم .
٢ - تأمين الاوكسجين للكائن الحـــــى .
٣ - تنظيم درجة حرارة الجســـــم .
٤ - طرد غاز ثانى اكسيد الكربون من الجسم .
٥ - توزيع الغذاء على الخلايـــــا .

---

٢٢) هناك بعض أوجه الشبه بين المواد المهضومه . من العبارات التاليه . ما هى العبارة التى تعتبر احسن تحليل لاوجه الشبه بين المواد المهضومه ؟

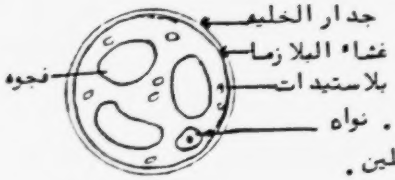
١ - المواد المهضومه تتكون من جزئيات صغيره ولكن قابله للذوبان فى الماء .
٢ - المواد المهضومه تتكون من جزئيات كبيره التى تستخدمهـــا الخلايا فى بناء اجزائها .
٣ - المواد المهضومه تتكون من جزئيات صغيرة التى تستخدمها الخلايا لانتاج الطاقه .
٤ - المواد المهضومه تتكون من جزئيات كبيره وغير قابله للذوبان فى الماء وتستخدمها النباتات .
٥ - المواد المهضومه تتكون من جزئيات صغيره ولا يمكن للخليه أن تستخدمها مباشره .

---

٢٣) ماهو الهرمون النباتى من الهرمونات التاليـــه :-

١ - الثيروكسين
٢ - الاوكســجين
٣ - الانسولـــين
٤ - البروجيسترون
٥ - الكورتيـــــون

٢٤) اى العبارات التاليه ينطبق على الشكل الذى تراه امامك ؟



١ - الشكل يوضح خليه حيوانيه .

٢ - الشكل يوضح خليهنباتيـــه .

٣ - الشكل يوضح مقطع عرض فى جذر نباتى .

٤ - الشكل يوضح رسم تخطيطى لخلايا الفلين .

٥ - الشكل يوضح مقطع عرض فى ساق نباتــى .

---

٢٥) تشبه العلاقه بين الخلايا والانسجه العلاقه بين .

١ - الاندوديرم والاكتودبرم .

٢ - الاعضاء والاجهـــــزه

٣ - الكبد والمـــــراره

٤ - كرات الدم الحمراء والبيضاء

٥ - الميتوكوندريا والخليه .

---

٢٦) اى العبارات التاليه صحيحه بالنسبه للنباتات .

١ - تتنفس النباتات فى الاصل من خلال الساق

٢ - تتم عملية التنفس فقط فى وجود ضوء الشمس .

٣ - تتم عملية التنفس والبناء الضوئى اثناء الليل

٤ - تنتج عملية التنفس فى النبات ثانى اكسيد الكربون والاوكسجين .

٥ - تتم عملية التنفس اثناء الليل والنهار .

---

٢٧) تعرف الحيوانات التى تقتل وتتغذى على حيوانات آخرى بـ

١ - الرميات

٢ - اكلة الاعشـــاب

٣ - اكلة اللحـــوم

٤ - المتكافلـه

٥ - اكلة الاعشاب واللحوم .

٢٨) يجب ان يكتب الاسم العلمى للكائنات الحيه كما فى الترتيب التالى :-

١ - النوع ثم الجنس .

٢ - الجنس ثم النوع

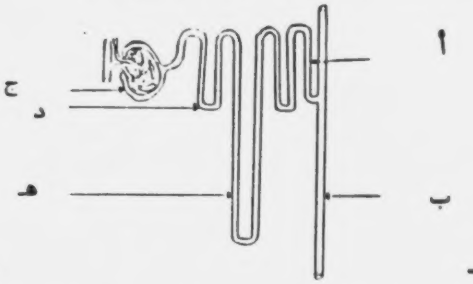
٣ - الجنس ثم العائله .

٤ - النوع ثم العائله .

٥ - النوع ثم الرتبه .

---

٢٩) بناء على الشكل الذى امامك . انحناء هنلى مؤشر عليه بالحرف .



١ - أ

٢ - ب

٣ - جـ

٤ - د

٥ - هـ

---

٣٠) قام رجل بتناول بعض الادويه بدون استشارة الطبيب مما ادى الى توقف الدوره الليمفاويه . ماهى العملية من العمليات التاليه التى سوف تتأثر جدا ؟

١ - انتاج كرات الدم الحمراء والبيضاء

٢ - النقل بين الدم وبين خلايا الجسم .

٣ - هضم المواد الكربوهيدراتيه .

٤ - هضم المواد البروتينيه .

٥ - الحركة الدمويه فى الجسم .

---

٣١) تعنى الطفرات الجينيه .

١ - التغير الذى يطرأ على المواد الوراثيه فى الخليه والذى يؤثر على الصفات الوراثيه .

٢ - " " " " " " " " يحطم الخليه .

٣ - " " " " تركيب الخلية عند مرحلة معينه من تكوين الخلية .

٤ - " " " " الجسم فى الافراد نتيجة للطقس الحار .

٥ - اثنان ماذكر .

---

٣٢) من وظائف (وظيفة) الهيكل العظمى فى الحيوانات الفقريه .

١ - حماية الاعضاء الداخليـــه
٢ - يعمل على التصاق العضلات مع بعضها .
٣ - يدعم الجســم .
٤ - جميع الوظائف السابق ذكرهـــا .
٥ - لاشئ مما ذكر اعـــــلاه .

٣٣) يتمثل الفرق بين الارنب الالبينو (البيضاء) والارنب السوداء بأن الارنب الالبينو
١ - تربت وعاشت فى غرفة مظلمـــه .
٢ - لها القدره على انتاج الانزيمات التى تساعدها على تكوين التفاعلات
٣ - لها تركيب خلوى مختلفا .
٤ - لاتستطيع تكوين صبغة الميلانين .
٥ - لاتستطيع ان تعيش اكثر من شهرين .

٣٤) الصفات التى تميز الرتبه فى تصنيف الكائنات الحيه اكثر عموميه من الصفات المميزه ل :-
١ - النوع والشعبـــه
٢ - الطائفـــه (القســم)
٣ - الجنس والطائفـــه .
٤ - النوع والجنس .
٥ - النوع والطائفـــه .

٣٥) يوجد فى الاميبا غشاء خلوى مرن ولا يوجد بها جدار خلوى . هذه الصفه تعتبر من
١ - صفات الخلايا النباتيـــه .
٢ - صفات الخلايا الحيوانيـــه .
٣ - صفات الخلايا الحيوانية والخلايا النباتيه .
٤ - صفات آخرى غير صفات الخلايا الحيوانية والنباتية .
٥ - ليس من الصفات المذكوره آعـــلاه .

٣٦) تعرف عملية انقسام الكائنات وحيدة الخلية الى خليتين متشابهتين ومطابقتين للخلية الام بـ

١ - تكوين الابواغ
٢ - التجزء
٣ - الانقسام الميوزى .
٤ - الانشطار .
٥ - الانقسام الميتوزى

٣٧) الوظيفة الاساسيه للغده الدرقيه

١ - تنظيم درجة حرارة الجسم .
٢ - تنظيم عملية الايض او التحول الغذائى .
٣ - تنظيم مستوى الكالسيوم فى الدم .
٤ - تنظيم عملية ضغط الدم .
٥ - تنظيم عملية التنفس .

٣٨) اذا ربطت قنوات البنكرياس فى الارنب فأن

١ - الارنب تتصرف وتسلك سلوك غريب .
٢ - هضم المواد الكربوهيدراتيه يتوقف ولكن المواد الدهنية تهضم بسرعة .
٣ - درجة حرارة الارنب وضغط الدم يرتفعان .
٤ - ضم المواد الدهنية يتم ببطء وليس هناك تأثير على هضم المواد الكربوهيدراتيه والبروتينات .
٥ - هضم المواد الكربوهيدراتيه والبروتينات يتم ببطء والمواد الدهنية لاتهضم .

٣٩) ماهى العملية التى تعتبر اساسيه فى ظهور اول ثمرة برتقال عديمة البذور من العمليات التاليه :-

١ - الطفرات الجينيه .
٢ - التزاوج .
٣ - الانتخاب الطبيعى .
٤ - التلقيح الذاتى .
٥ - اثنان مما ذكر .

٤٠) عند مقارنة التركيب الخلوى فى البكتيريا مع التركيب الخلوى للطحالب فأن

١ - البكتريا لاتحتوى على غشاء نووى ولكن الطحالب تحتوى على غشاء نووى والمواد الوراثية توجد داخل النواه .

٢ - كل من الطحالب والبكتيريا يحتويان على نواه بدون غشاء نووى والمواد الوراثيه توجد فى السيتوبلازم .

٣ - كل من الطحالب والبكتيريا يحتويان على نواه وغشاء نووى والمواد الوراثيه توجد داخل النواه .

٤ - البكتيريا تحتوى على بلاستيدات واجسام جولجى بينما الطحالب تفتقر هذه الاجزاء .

٥ - البكتيريا تحتوى على نويه بينما الطحالب لاتوجد بها نويات .

---

٤١) يتكون الاسم العلمى للاسد من جزئين كما يلى Felis leo. الجزء "leo" يعود على :-

١ - الجنس

٢ - الطائفه .

٣ - النوع .

٤ - العائله .

٥ - الرتبه .

---

٤٢) اذ زادت عملية انتزاع مجموعة الامين من الاحماض الامينيه اثناء عمليات التمثيل الغذائى فان مايظهر اولاً هو :-

١ - زيادة نسبة الامونيا فى الجسم .

٢ - نقص مستوى الماء فى الجسم .

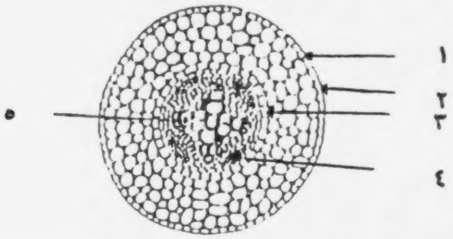
٣ - التسمم الخلوى .

٤ - الاجابه رقم (١) والاجابه رقم (٢)

٥ - ليس من الاجابات السابقه .

---

٤٣) بناء على الشكل الذى امامك ، اللحاء يحمل الرقـــم .



١ - ١
٢ - ٢
٢ - ٤
٤ - ٥
٥ - ٣

---

٤٤) يعمل حامض الـ د .ن .أ وحامض الـر. ن .أ (RNA و DNA) مع بعض فى جميع الكائنات ولكن فى الفيروسات لا يوجد الا حامض الـ RNA لذلك هذه الفيروسـات .

١ - لاتستطيع ان تعيش .
٢ - لاتحمل الصفات الوراثيـــه .
٣ - تجعل الـ RNA ينقل الصفات الوراثيـــه .
٤ - تستطيع ان تعيش وتتكاثر خارج جسم الحيوان او النبات المضيف .
٥ - لا يحتوى على RNA الذى ينقل الصفات الوراثيـــه .

---

٤٥) تسمى حركة تبادل الغازات كالاوكسجين وثانى اكسيد الكربون بـ

١ - التنفس الخلـــوى .
٢ - التنفس الخارجـــى .
٣ - التنفس اللاهوائـــى .
٤ - التنفس العادى .
٥ - لاشئ مما ذكر اعـــلاه .

---

٤٦) رجل عمره ٣٥ عاما بلغ طوله حوالى ٩٥ سم بعكس الاقزام فأن هذا الرجل لديه تخلف عقلى وجنسى وهذا التخلف نتيجة للنقص فى افراز

١ - الغدة النخاميـــه .
٢ - الغـده جار الدرقيـــه .
٣ - الغـدة الدرقيـــه .
٤ - جزر لانجرهانز فى البنكرياس .
٥ - الغدة جار الكلويـــه .

٤٧) قام مدرس الاحياء فى المعمل بصب عصاره البنكرياس المخففه فى كأس به نشا وفول مطحون وفى اليوم الثانى قام المدرس بدراسة الخليط فوجد ان هناك اربع مركبات فى الكأس . ماهو المركب الذى لا يمكن ان يكون فى الكأس ضمن هذه المركبات .

١ - جليكــوز
٢ - جلســرول
٣ - احماض امينيــه
٤ - احماض دهنيــه
٥ - حامض الهيدروكلوريــك

٤٨) فى معظم المناطق تأكل الذئاب الغنم وتعتبر النباتات الخضراء الغذاء الاساسى للاغنام . ماهى السلسله الغذائية فى هذه الحالـه ؟

١ - المنتجات : النباتات الخضراء والمستهلكات الاولى : الذئاب ، المستهلكات من الدرجة الثانية الاغنــام .
٢ - المنتجات : النباتات الخضراء المستهلكات الاولى : الاغنام ، المستهلكات من الدرجة الثانية : الذئــاب .
٣ - المنتجات : الاغنام ، المستهلكات الاولى النباتات الخضراء ، والمستهلكات من الدرجة الثانية : الذئاب
٤ - المنتجات : الذئاب المستهلكات الاولى النباتات الخضراء والمستهلكات من الدرجة الثانية : الاغنام .
٥ - المنتجات : النباتات الخضراء ، المستهلكات الاولى الذئاب المستهلكات من الدرجة الثانية النباتات الزئاب .

٤٩) أى الاجزاء التاليه فى النبات يمكن مقارنة وظيفتها بوظيفة الشرايين فى الانسان ؟

١ - الخشب
٢ - الثغــور
٣ - اللحــاء
٤ - الخلايا الحجريــه
٥ - خلايا الفلــين .

٥٠) يتمثل الفرق الاساسى بين المناعة النشطه والمناعه السالبه فى أن المناعة السالبه :-

١ - تتطلب وقت من الزمن حتى يتمكن الجسم من تكوينها .

٢ - تعتبر مناعة ثابته او دائمه .

٣. تتطلب التطعيم ببكتريا او فيروسات ميته او مضعفه فى جسم الانسان

٤ - تكتسب فوريا بواسطة حقن المصل فى دم الانسان .

٥ - تتطلب ادخال انتيجين الى دم الانسان .

---

٥١) ماهى الحيوانات التى تعيش عادة فى منطقة ذات حرارة عالية وكمية مطر قليلة جدا والنباتات الخضراء قليلة جدا .

١ - الضفادع ، الحصام ، البط

٢ - الثعلب ، والثعابين ، الفئران .

٣ - البابون (القرد) ، الاسد ، القطط

٤ - الارانب ، الوز ، الخيول

٥ - اثنان مما ذكر .

---

٥٢) تخرج النباتات الخضراء ثانى اكسيد الكربون نتيجة لـــ

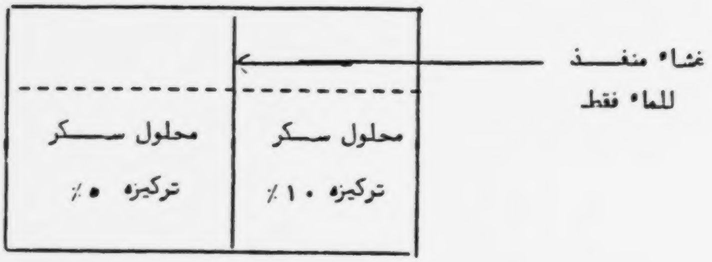
١ - عملية النتح

٢ - عملية البناء الضوئى

٣ - علمية التنفس .

٤ - علمية بناء مادة السليلوز

٥ - عملية نقل الماء فى النبات



٥٣) قسمت غرفه فى مصنع كيمائى الى قسمين متساويين بواسطة غشاء شبه منفـــذ لجزئيات الماء فقط كما فى الشكل الذى امامك . وضع فى الجزء الايسر من هذه الغرفه محلول سكر بتركيز ٥ ٪ ووضع فى الجزء الايمن محلول سكر بتركيز ١٠ ٪ على ذلك فأن :-

١ -الماء يتحرك عبر الغشاء نحو الجزء الايسر الذى تركيزه ٥ ٪ فقط .
٢ -السكر يتحرك عبر الغشاء فى كلا الاتجاهين .
٣ -الماء يتحرك عبر الغشاء فى كلا الاتجاهين بالتساوى .
٤ - درجة الحرارة تتحكم فى كمية الماء المتحركـــه .
٥ -الماء يتحرك عبر الغشاء نحو الجهه اليمنى من هذه الغرفه .

---

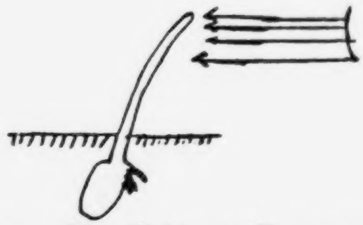
٥٤) بناء على نظام التصنيف المستخدم حاليا . ماهو الحـيوان الذى لا ينتمى الى الاربعة الاخرين مما يلـــي :-

١ -السحليـــه .
٢ -التمســـاح .
٣ -الثعبـــان .
٤ -السلمندر
٥ -السلحفـــاه

---

٥٥) ماهو التركيب الذى يمثل عضوا فى جسم الانســـان ؟

١ -كريـات الدم البيضــــــاء
٢ -الجهاز الاخراجـــى .
٣ -الكليـــــــــه
٤ -بلازمـــا الـــدم
٥ - كرات الدم الحمـــراء



٥٦) فى هذا الشكل تلاحظ ان النبته قد انحنت نحو الضوء هذا الانحناء نتيجة لـ

١ - حركة هرمون النمو الى الجانب المواجه للضوء والذى يساعد على استطالة الخلايا فى تلك المنطقة .

٢ - حركة هرمون النمو الى الجانب المعاكس للضوء والذى يساعد على استطالة الخلايا فى تلك المنطقه .

٣ - وجود تركيز متساوى هرمون النمو فى كلا الجهات النبته .

٤ - حركة هرمون النمو الى الجذر عند ما يتعرض النبات للضوء.

٥ - زيادة هرمون النمو فى النبته .

---

٥٧) هناك عدة عمليات تساهم فى عملية نقل الماء فى النباتات . ما هو العامل الذى له الدور الاساسى فى نقل الماء الى النباتات .

١ - عمر النبات .

٢ - الارتفاع عن سطح البحر .

٣ - الضغط المضاد فى خلايا اللحاء فى الجذر

٤ - التماسك والتلاصق بين جزئيات الماء .

٥ - اجابة رقم ١ ورقم ٢

---

٥٨) عند درجة حرارة ورطوبة عادية قد يشرب الانسان الكثير من الماء فيقوم الجسم بالتخلص من الماء بواسطة .

١ - الكلى والرئتان

٢ - الكلى

٣ - الكلى والجلد

٤ - الامعاء الدقيقة والجلد

٥ - الامعاء الدقيقة والامعاء الغليظه .

٥٩) اذا وضع مدرس الاحياء قطرة دم على شريحه المجهر واضاف عليها قطرة من الماء لتخفيف الدم وبعد اضافة الماء لاحظ المدرس بأستخدام المجهر ان خلايا الدم تفجرت وتحطمت.ما حدث لكرات الدم ماهوالآنتيجه لاستخدام .

١ - ماء مالح .
٢ - ماء عذب
٣ - شريحة المجهر الزجاجية .
٤ - كمية قليلة من الدم .
٥ - كرات الدم او خلايا الدم فى الهواء مباشرة .

---

٦٠) ماهى الشعبة التى تحتوى على زوائد مزدوجة من الشعب التاليه .
١ - شعبة الرخويات
٢ - شعبة الديدان الحلقيه .
٣ - شعبة المفصليات
٤ - شعبة شوكيات الجلد
٥ - شعبة الديدان المفلطحه .

شكرا لحسن تعاونكم معنا !!!!

عامر عبدالله سليم الشهراني

Appendix C

Student's Background Information Questionnaire

English Version

Student's name:________________________________

School's name:_________________________________

Educational district's name:___________________

Instruction: circle the number to indicate your response.

Example: Do you study science?

1. Yes.
2. No

The answer here is " Yes " , Circle number " 1 "

1. Your age:

   1. 17-19 years.
   2. 20-22 years.
   3. more than 23 years.

2. Is your nationality Saudi?

   1. yes.
   2. no.

3. Your father's highest education level (circle one).

   1. can not read or write.
   2. no formal school, but can read only.

3. no formal school,
   but can read and write.
4. elementary school.
5. junior high school.
6. secondary school.
7. bachelors degree.
8. masters degree.
9. doctoral degree.

4. Do you have older brothers or sisters?

   1. yes.
   2. no.

5. How many of them are going to college?

   1. no one.
   2. one.
   3. two.
   4. three.
   5. more than three.

6. Your father's primary Occupation: (select one only)

   1. businessman.
   2. engineer.
   3. farmer.
   4. work in the medical field.
   5. work in the military.
   6. teacher.
   7. not working.
   8. governmental employee.
   9. others, please specify ....

7. Your mother's highest educational level (circle one).

   1. can not read or write.
   2. no formal school,
      but can read only.
   3. no formal school,
      but can read and write.
   4. elementary school.
   5. junior high school.
   6. secondary school.
   7. bachelors degree.
   8. masters degree.

8. What was your major reason for selecting a science major?

   1. friend influence.
   2. personal decision.
   3. parent decision.
   4. better job opportunities.
   5. good reputation in the society.
   6. good science grades qualified me to study in science division.

9. Would you consider science teaching as a career?

   1. yes.
   2. no.

10. How many years have you been at the secondary school level?

   1. three years.
   2. four years.
   3. more than four years.

11. Indicate your interest in each of the following: (circle one in each row)

	Interest			
	High	Moderate	Low	None
1. Biology	4	3	2	1
2. Chemistry	4	3	2	1
3. Physics	4	3	2	1
4. Geology	4	3	2	1

12. Did you enjoy science classes in the past two years? (circle one in each row)

	High	Moderate	Low	None
1. Biology	4	3	2	1
2. Chemistry	4	3	2	1
3. Physics	4	3	2	1
4. Geology	4	3	2	1

Appendix D

Student's Background Information Questionnaire

Arabic Version. A translation of the English Version

معلومات اساسيه عن الطالب

اســم الطالب : ________________________

اســم المدرسه : ________________________

اسم المنطقة التعليمية التابع لها : ____________________

ارشــادات :

ارسم دائره حول الرقم المقابل للاجابه الصحيحه . . اختر اجابه واحده فقط .

مثــال : هل تدرس مادة الاحيــاء ؟

① - نعــم

٢ - لا

الاجابه الصحيحه هنا نعــم . ارسم الدائرة حول الرقم ١ ← ①

أولا : كم عمــرك ؟

١ - ١٧ - ١٩ سنه

٢ - ٢٠ - ٢٢ سنه

٣ - اكبر من ٢٢ سنه

ثانيا : هل أنت سعــودى .

١ - نعــم

٢ - لا

ثالثا : مستوى والدك التعليمــي .

١ - لا يستطيع القراءة أو الكتابــه .

٢ - لم ينتظم في مدرسه ولكن يستطيع ان يقرأ فقط .

٣ - لم ينتظم في مدرسه ولكن يستطيع ان يقرأ ويكتب .

٤ - حاصل على الشهادة الابتدائيه أو أقل .

٥ - حاصل على الشهادة المتوسطه .

٦ - حاصل على الشهادة الثانويــه .

٧ - حاصل على الشهادة الجامعيــه .

٨ - حاصل على شهادة الماجستير

٩ - حاصل على شهادة الدكتوراه .

رابعا : هل عندك اخوان أو اخوات أكبر منك ؟

١ - نعم

٢ - لا

خامسا : اذا كانت الاجابه فى السؤال السابق بنعم فكم عدد اخوانك واخواتك اللذين يدرسون فى الجامعه ؟

١ - لا أحد .

٢ - واحد .

٣ - اثنان .

٤ - ثلاثه .

٥ - اكثر من ثلاثه .

سادسا : ماهي وظيفة الوالد الاساسيه .

١ - رجل أعمال .

٢ - مهندس .

٣ - مزارع

٤ - يعمل فى المجال الصحي .

٥ - يعمل فى الجيش .

٦ - مدرس

٧ - لا يعمل .

٨ - موظف مدني .

٩ - وظيفة اخرى وضحها من فضلك ....

سابعا : مستوى والدتك (أمك) التعليمي .

١ - لاتستطيع القراءه أو الكتابه .

٢ - لم تنتظم فى مدرسه ولكن تستطيع القرأة .

٣ - " " " " " " " " والكتابه .

٤ - حاصله على الشهاده الابتدائية أو اقل .

٥ - حاصله على الشهادة المتوسطه .

٦ - حاصلة على الشاده الثانويه

٧ - حاصلة على الشهادة الجامعيه .

٨ - " " الماجستير .

ثامنا : ماهو السبب الرئيسي لاختيارك للقسم العلمي ؟

١ - تأثير الزملاء .

٢ - قرار شخصي .

٣ - قرار عائلي .

٤ - فرص العمل فى المستقبل .

٥ - سمعة التخصص فى المجتمع.

٦ - درجاتي فى المواد العلميه جعلتنى مؤهل للدراسة فى هذا القسم .

تاسعا : هل من الممكن ان تختار تدريس العلوم كمهنه فى المستقبل ؟

١ - نعم

٢ - لا

عاشرا : كم سنه لك فى المرحلة الثانوية

(أ) ٣ سنوات (ب) ٤ سنوات (ج) اكثر من اربع سنوات

الحادى عشر : وضح رغبتك فى كل مما يلى (ارسم دائرة حول رغبتك في كل صف) .

	رغبة عاليه	متوسطه	منخفضة	لاتوجد رغبه
١ - الاحياء	٤	٣	٢	١
٢ - الكيمياء	٤	٣	٢	١
٣ - الفيزياء	٤	٣	٢	١
٤ - الجيولوجيا	٤	٣	٢	١

الثاني عشر : هل تمتعت بالمواد العلميه فى السنتين الماضيتين ؟ ارسم دائرة حول الاجابه فى كل صف.

	تمتع عالى	متوسطه	منخفضه	لا يوجد تمتع
١ - الاحياء	٤	٣	٢	١
٢ - الكيمياء	٤	٣	٢	١
٣ - الفيزياء	٤	٣	٢	١
٤ - الجيولوجيا	٤	٣	٢	١

Appendix E

Teacher's Background Information Questionnaire

English Version

Teacher's name: ______________________________

School's name: ______________________________

Educational district's name: __________________

Instruction: circle the number that represent your response.

Example: Do you teach science at the secondary school level?
Your response is "Yes", circle number "1".

1. yes.
2. no.

1. Age

1. 20 - 29
2. 30 - 39
3. 40 - 49
4. 50 - 59

2. What are you teaching?

1. biology.
2. physics.
3. chemistry.
4. geology.

3. Number of years teaching science at the secondary school level:

1. 1 year.
2. 2 years.
3. 3 years.
4. More than three years.

4. What is your highest degree and in what field?

1. bachelors degree in ....
2. masters degree in ....
3. doctoral degree in ....

5. Your nationality ?

1. Saudi.
2. None-Saudi.

6. As a science teacher, what was your major reason for selecting science teaching as a career? (select one)

1. science reputation in society.
2. job opportunities
3. science is easy for me.
4. science is interesting.
5. Other ....

7. What influnced you most in selecting science teaching as a profession?

1. friend.
2. personal decision.
3. parents.
4. salary.
5. other ....

8. The average number of students in your science classrooms:

1. 11 - 15
2. 16 - 20
3. 21 - 25
4. 26 - 30
5. 31 - 35
6. More than 35.

9. Average of hours teaching science every week:

1. 5 - 9
2. 10 - 14
3. 15 - 19
4. 20 - 24
5. More than 24

10. Does your school have enough laboratory equipment and supplies?

 1. Yes
 2. No

11. How adequate are material and equipment in your school for teaching science by lecturing approach? Audio-Visual instruction? and laboratory activities?

 1. Very Abundant
 2. Abundant
 3. Little
 4. None

12. In your opnion, how much of a problem to science teaching is each of the following? (circle your response)

3 = serious problem
2 = some what of a problem
1 = not significant problem

1. lack of inservice training 3 2 1

2. Inadequate facilities 3 2 1

3. lack of science equipment and supplies .. 3 2 1

4. lack of teacher planning time 3 2 1

5. teachers are not prepared to teach 3 2 1

6. lack of laboratory assistant 3 2 1

Appendix F

Teacher's Background Information Questionnaire

Arabic Version. A translation of the English Version

معلومات اساسيه عن المدرس

اسم المدرس : ....

اسم المدرسه : ....

اسم المنطقة التعليميه : ....

ارشادات :

ارسم دائره حول الرقم المقابل للاجابه الصحيحه .. أختر اجابه واحده فقط .

مثال :

هل تدرّس مادة العلوم فى المرحله الثانويه ؟

① - نعم

٢ - لا

الاجابه الصحيحة هنا نعم - ارسم الدائره حول الرقم ١ ← ①

أولا : العمر :

أ - ٢٠-٢٩ سنه

ب - ٣٠-٣٩ سنه

جـ - ٤٠-٤٩ سنه

د - ٥٠-٥٩ سنه

ثانيا : ماذا تدرّس ؟

١ - احياء

٢ - كيمياء

٣ - فيزياء

٤ - جيولوجيا

ثالثا : عدد سنوات الخبره فى تدريس المواد العلميه فى المرحله الثانويه .

١ - سنه واحده

٢ - سنتان

٣ - ثلاث سنوات

٤ - اكثر من ثلاث سنوات .

رابعا : ماهي اعلى شهادة حصلت عليها وفي أى تخصص ؟

١ - بكالوريوس في ....

٢ - ماجستير في ....

٣ - دكتوراه في..........................

خامسا : الجنسيه .

١- سعودى

٢- غير سعودى

سادسا :

كمدرس علوم . . . ماهو السبب الذى دفعك لاختيار تدريس العلوم كمهنه ؟

١ - سمعة تدريس العلوم فى المجتمع .

٢ - فرص عمل مدرس العلوم متوفره .

٣ - مادة العلوم سهله التدريس بالنسبه لي .

٤ - مادة العلوم ممتعه .

٥ - اسباب آخرى ، اذكرها : ....

سابعا : كيف قررت ان تصبح مدرس علوم ؟

١ - تأثير الزملاء .

٢ - قرار شخصي .

٣ - قرار عائلي .

٤ - رواتب مدرسي العلوم مغريه .

٥ - أشياء أخرى أذكرها : ....

ثامنا : متوسط عدد الطلاب فى الصفوف التى تدرسها ؟

(١) ١١-١٥ طالب .

(٢) ١٦ - ٢٠ طالب .

(٣) ٢١ - ٢٥ طالب .

(٤) ٢٦ - ٣٠ طالب .

(٥) ٣١ - ٣٥ طالب .

(٦) اكثر من ٣٥ طالب .

تاسعا : متوسط الحصص التى تدرسها فى الاسبوع .

١ - ٥ - ١٠ حصص
٢ - ١١ - ١٥ حصه
٣ - ١٦ - ٢٠ حصه
٤ - ٢١ - ٢٥ حصه
٥ - اكثر من ٢٥ حصه

عاشرا : هل يوجد فى معمل العلوم مواد وادوات كافيه اذا قارنت مدرستك بمدارس اخرى فى المنطقه .

١ - نعم
٢ - لا

الحادى عشر : ماهو مدى توفر الادوات والمواد في تدريس العلوم بالطرق التاليه : الطريقه الالقائيه ، الاستعانه بالوسائل السمعيه والبصريه واستخدام المعامل فى تدريس العلوم .

١ - متوفره بكثره .
٢ - متوفره
٣ - قليله
٤ - معدومه .

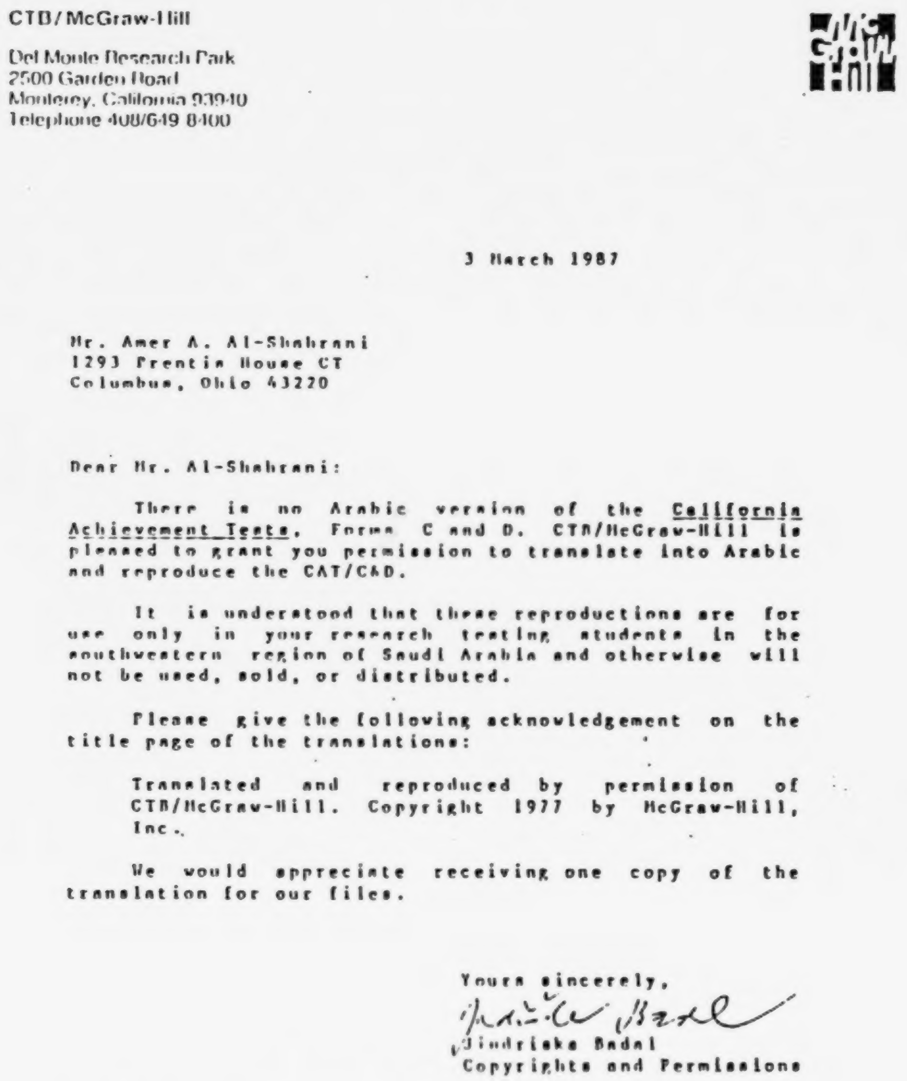
الثاني عشر : في رأيك ماهي أكبر مشكلة تواجه تدريس العلوم فى مدرستك من الاشياء التاليه : (اعمل دائرة حول الاجابه المناسبه)

٣ = مشكله خطيره وكبيره .
٢ = مشكله بسيطه نوعا ما .
١ = ليست بمشكلة كبيره .

١ - قلة ونقص الدورات التدريبيه ٣ ٢ ١
٢ - عدم توفر الامكانيات والتسهيلات ٣ ٢ ١
٣ - عدم توفر الاجهزه العلميه والمواد ٣ ٢ ١
٤ - عدم توفر الوقت للمدرس فى التحضير........... ٣ ٢ ١
٥ - مدرسي العلوم غير مؤهلين لتدريس العلوم ٣ ٢ ١
٦ - عدم وجود محضر المعمل ٣ ٢ ١

Appendix G

A copy of the Permisson Letter to Translate and Use The California Achievement Test in Mathematics (CAT/C book 19)



CTB/McGraw-Hill

Del Monte Research Park
2500 Garden Road
Monterey, California 93940
Telephone 408/649 8400

3 March 1987

Mr. Amer A. Al-Shahrani
1293 Prentis House CT
Columbus, Ohio 43220

Dear Mr. Al-Shahrani:

There is no Arabic version of the California Achievement Tests, Forms C and D. CTB/McGraw-Hill is pleased to grant you permission to translate into Arabic and reproduce the CAT/C&D.

It is understood that these reproductions are for use only in your research testing students in the southwestern region of Saudi Arabia and otherwise will not be used, sold, or distributed.

Please give the following acknowledgement on the title page of the translations:

> Translated and reproduced by permission of CTB/McGraw-Hill. Copyright 1977 by McGraw-Hill, Inc.

We would appreciate receiving one copy of the translation for our files.

Yours sincerely,

Jindriska Badal
Copyrights and Permissions

Appendix H

Checklist for Assessment of Science Teacher: Puplis's Perceptions (CAST:PP) -- English Version*

Directions: Circle the letter on the answer sheet which most closely states your honest behavior of your teacher or what usually happens in your classroom. Mark only one response under each of the questions. Make all your responses on the answer sheet. Make no marks on this booklet. You may possibly find that each phrase in a particular response does not apply to your teacher. Please mark the one that most closely describes your teacher or what usually is happening in your classroom. Read all the responses before you choose one.

For example, if Answer "B" for a particular question best describes your feelings, circle the letter in the appropriate space on the answer sheet.

12. A [✓ B] C D E

---

* This instrument has been adopted from the work of William R. Brown, Betty J. Brown, and Robert W. Howe, The Ohio State University. November. 1970 edition.

CAST:PP

1. How does your teacher keep his class in order?

   a. Our teacher makes us feel free and natural. We are very interested in and busy with school work. We are able to take care of ourselves.

   b. Our teacher sees to it that work goes on with little or no stopping. We usually pay attention to the work at hand.

   c. Our teacher is able to bring the class back to order with a few warning looks or words. The room is fairly quiet. Some students are whispering and not paying attention . The teacher is usually aware of minor misbehaviors.

   d. Our teacher tries but is unable to control the class. We are restless. We do not pay attention. The classroom is noisy.

   e. Our teacher is strict and rules with an iron hand. Most students are tense and nervous. The classroom is very quiet. Students do not respect our teacher.

2. Is your teacher more interested in you or in the subject he/she is teaching?

   a. Our teacher is interested in us as people. He/She is aware that we can do, are interested in, and need different things. Our teacher wants to help us with our personal problems as well as with the subject he/she is teaching. He/she tries and often does help us with our problems.

   b. Our teacher is aware of our different needs but does little to help us with them. He/she attention to our need to learn the subject he/she is teaching. He/she expects less of the lower ability students than of the higher ability students.

   c. Our teacher is aware of our different needs but thinks the teacher should teach only his/her subject. Our teacher talks about our individual differences but does little about the differences.

d. Our teacher does not pay attention to any of our individual needs. He/she is interested only in the subject he/she is teaching. Sometimes we do "busy work" that has little meaning to us.

e. Our teacher ignores us as individuals. He/she thinks only of learning the subject. Every student must learn the same things. We do "busy work", and we usually do work from the textbook.

3. How does your teacher feel about students?

a. Our teacher looks at us the way we really are. He/she is friendly and understanding. He/she likes us and enjoy having us around. He/she listens to our opinions

b. Our teacher understands that we are able to learn and grow up but does little to help us. He/she seems to want to know us better.

c. Our teacher often does not try to understand our feelings or opinions. He/she thinks we just need to grow up. He/she usually grades us by what adults can do rather than by what we can do.

d. Our teacher thinks of us as "little adults" not as teenagers. He/she tends to expect too much or too little of us.

e. Our teacher does not try to understand us. He/she is not interested in the opinions of teenagers. He/she is often feel at ease or uncomfortable when we are with him/her.

4. How does your teacher understand students who have behavior problems?

a. Our teacher is not as worried about students who misbehave in class as he/she is about students who are "too quiet". He/she tries to figure out why students do certain things and help them solve their problems.

b. Our teacher is aware that students have problems. He/she looks for reasons why students misbehave. He/she expects students to behave even if they have problems, and he/she will punish them if he/she has to.

c. Our teacher usually is not aware that students have reasons for doing the things they do. He/she knows he/she should learn something about the background of his/her students, but often punishs instead.

d. Our teacher is no aware that students have problems. He/she treats all students who misbehave the same way. He/she always punishs them.

e. Our teacher thinks students who do not obey are the most serious problems. He/she thinks the shy, quiet students are the "perfect students". He/she does not try to understand why students act the way they do. He/she punishs all students who misbehave.

5. What do the students think of your teacher?

a. Students can talk freely with our teacher. They like our teacher very much.

b. students respect and admire our teacher, but they feel uncomfortable when talking to him personally.

c. Most students like our teacher and are willing to do what he wants.

d. Students do not fear our teacher, but they do not respect or like him.

e Students fear and stay away from our teacher. They might even harm him if they could.

6. What do you do in your science class?

a. We often talk about the problems scientists have in the discovery of a scientific principle. We also talk about the facts behind a scientist's conclusions. If we do not agree with our teacher, he wants us to say so. We often have time to talk among ourselves about ideas in science. We do most of the experiments and demonstrations ourselves.

b. We sometimes talk about the problems scientists have in the discovery of a scientific principle. We also talk about the facts that are behind a scientist's conclusions. We sometimes do experiments and demonstrations ourselves. We can question what our teacher says.

c. We have talked a few times about the problems scientists have in the discovery of a scientific principle. We spend part of our class time answering our teacher's questions. We also write answers to questions from our book or study guides. We do some experiments ourselves.

d. We ask questions to clear up what the teacher or our book has told us. We watch our teacher do demonstrations. We write answers to questions from our book or study guides. We answer our teacher's questions.

e. We must copy down and memorize what our teacher tells us. Most of our questions are to clear up what our teacher or our book has told us. We often write answers to questions from our book or study guides.

7. What does your teacher do in class?

a. Our teacher helps us understand the reason or purpose for a lesson before we start it. Our teacher often questions us on ideas we studied earlier. He/she asks us for the facts behind the statements in our textbook. Our teacher often asks us to explain diagrams and graphs.

b. Our teacher often questions us on ideas we studied earlier. He/she asks us for the facts behind some of the ideas in our textbook. He/she sometimes asks us to explain diagrams and graphs.

c. Our teacher spends most of the time telling us about science. He/she repeats much of what our textbook says. Our teacher sometimes questions us about ideas we studied earlier.

d. Our teacher sometimes repeats exactly what our textbook says. If students do not agree, our teacher usually tells us who is right. Most of the time our teacher tells us about science.

e. Our teacher shows us that science has most of the answers to questions about the natural world. If students do not agree during a discussion, our teacher tells us who is right. Our teacher often repeats exactly what our textbook says.

8. How does the teacher use the textbook and references materials?

a. Our teacher expects us to find the major ideas in our textbook. We must also find the facts to prove the ideas. He/she shows us how to question ideas in our textbook. Our teacher often provides time to read about science in magazines and other books.

b. Our teacher expects us to learn some of the details in our textbook. We can use magazines and other books in the room if we want. Our teacher shows us how to question ideas in our textbook.

c. Our teacher expects us to learn much of the details in our textbook. We look for some of the major ideas in our textbook. We also find the facts to prove the ideas. We sometimes outline parts of our textbook. The only science we talk about is from our textbooks and our teacher's notes.

d. Our teacher expects us to outline part of textbook. The only science we talk about is from our textbook and our teacher's notes. We must learn most of the details in our textbook.

e. Our teacher does not like us to question information from our textbook. We often write definitions to words. We must outline parts of our textbook. We must memorize most of the details in our textbook.

9. What are your test like? How are they used?

   a. Our tests have many questions about our laboratory work. Our test often require us to figure out answers to new problems. Sometimes we find ways of looking for answers to problems. Often we do things in the test that we have learned in our laboratory such as making observations and explaining data.

   b. Our tests have many questions about our laboratory work. Our tests sometimes require us to figure out answers to new problems. Sometimes we do things in the test that we have learned in our laboratory such as making observations and explaining data.

   c. Our tests sometimes ask us to label drawings. Our test sometimes have questions about our laboratory work. Sometimes we must tell about ideas that we learned earlier.

   d. Our tests often ask us to write definitions to words. We do not use mathematics to answer questions in our tests. Often we must label drawings.

   e. Our tests often asks us to write definitions to words. Often we must label drawings. We do not have chance to talk about the test questions in class.

10. What do you do in the laboratory?

   a. We talk about the reasons for an experiment before we do it. We often try our own ways of doing the laboratory work. we can compare our answers to those of others when we finished. We are allowed to do experiment on our own.

   b. We talk about the reasons for most experiments before we do them. The data one student gathers from an experiment are often different from the data gathered by another student. We do some experimenting on our own.

   c. We sometimes talk about the reasons for experiments. We sometimes compare our answers to those of others when we are finished. we spend less than one third of our time doing laboratory work.

d. We sometimes know the answers to a question before we do an experiment. We seldom talk about the reason for an experiment. We spend less than one fourth of our time doing laboratory work.

e. We are not allowed to do experiments on our own. We know the answer to a question before we do an experiment. We do not talk about the reasons for an experiment. We spend very little of our time doing laboratory work.

Appendix I

Checklist for Assessment of Science Teacher: Pupil's Perception (CAST:PP) -- Arabic Version.

A translation of the English Version

قائمة تقييم مدرسي العلوم : ملاحظة أو ادراك الطلاب

CAST

ارشادات :

ارسم دائرة حول الحرف المناسب في ورقة الاجابة والذي يعبر بصدق من سلوك مدرسك ومن مايحصل في صفك ، اختار اجابه واحدة لكل سؤال ولاتكتب في ورقة الاسئلة . من الممكن ان تجد بعض الاسئلة لاتنطبق على مدرسك تماما ولكن الرجاء ان تختار اقرب اجابه أو عبارة والتي تصف مدرسك أو مايحدث في فصلك .

اقرأ جميع الاجابات المحتمله قبل اختيار الاجابه النهائيه .

مثال :

اذا كانت الاجابه " ب " هي الاجابه الصحيحه في أي سؤال أرسم دائرة حول الحرف المناسب في ورقة الاجابه .

١٢- أ [✓ ب] جـ د هـ

ملاحظه : هذا الاستبيان مُتبنى ومترجم من عمل وليم براون والدكتور روبرت هاو جامعة اوهايو الحكوميه ١٩٧٠م .

---

* ترجمه عامر عبدالله الشهراني .

١ : كيف يقوم مدرس العلوم بالحفاظ على النظام والهدوء فى الفصل ؟

أ - يجعلنا المدرس نحس بالراحه ونكون طبيعيين ولدينا الرغبه ومشغولين بالواجبات المدرسيه . . لدينا الاستطاعه على الاهتمام بأنفسنا .

ب - يرى مدرسنا ان العمل المدرسي مستمر مع توقف بسيط أو بدون توقف ونحن نعطي اهتمام للعمل الذى نحن نمارسه فى المدرسه .

جـ - مدرسنا له القدره على اعادة النظام أو الهدوء فى الفصل ببعض النظرات أو الكلمات التحذيريه . . الفصل هادئ نسبيا . ولكن بعض الطلاب يتهامسون ولا يعطون اهتمام للمدرس . المدرس دائما على علم ببعض سوء السلوك او التصرفات .

د - مدرسنا يحاول ولكن لا يستطيع اعادة النظام أو الهدوء فى الفصل ونحن متضجرين ومشدودى الاعصاب ولا نعطي اهتمام والفصل دائما في فوضى وازعاج .

هـ - مدرسنا شديد ويضرب بيد من حديد ومعظم الطلاب مشدودى الاعصاب ومنزعجين الفصل هادئ تماما ولكن الطلاب لا يحترمون المدرس .

٢ : هل مدرس العلوم مهتم فيك كطالب او مهتم فى المادة التى يدرسها ؟

أ - مدرسنا مهتم فينا كطلاب وهو على علم بأننا مهتمين ومحتاجين وراغبين على عمل اشياء كثيره. هو يريد مساعدتنا فى حل مشاكلنا الخاصة ومشاكل المادة التي هو يدرسها ويحاول مساعدتنا فى حل مشاكلنا .

ب - مدرسنا على علم بأحتياجاتنا المختلفة ولكن يبذل الجهد القليل لمساعدتنا . ويعطى انتباه للاشياء التى نحتاجها لكي نتعلم مادته هو يتوقع القليل من الطلاب اللذين قدراتهم على التعلم منخفضة ويتوقع الكثير من الطلاب سريعي التعلم .

جـ - مدرسنا على علم بأحتياجاتنا المختلفة ولكنه يعتقد بأنه ملزم بمادته فقط وهو يتكلم دائما عن الفروق الفرديه بين الطلاب ولكنه يعمل القليل فى هذا المجال .

د - مدرسنا لا يعطى اى اهتمام لاحتياجاتنا الفردية وهو مهتم بالمادة التى يدرسها وبعض الاوقات نقوم بعمل نشاطات التى ليس لها قيمة او معنى بالنسبة لنا .

هـ - مدرسنا يتجاهلنا كأشخاص.يفكر فقط فى تدريس مادته وتعلمها وعلى كل الطلاب ان يتعلموا نفس الشئ.ونقوم بعمل بعض النشاطات من الكتاب المدرسي المقرر .

٣ : ماهو شعور المدرس تجاه طلابه ؟

أ - مدرسنا ينظر الينا كما نحن وهو مدرس ودود وفاهم.هو يحترمنا ويتمتع بوجودنا كطلاب فى صفه ويستمع لآرائنا .

ب - مدرسنا على علم فاننا قادرين على التعلم والتطور ولكنه يفعل القليل فى هذا المجال هو يبدو وانه يريد التعرف علينا اكثر .

جـ - مدرسنا غالبا لا يحاول ان يفهم احاسيسنا وارائنا وهو يعتقد بأننا نحتاج ان ننمو وهو يعاملنا ويقوّمنا كما يقوم الكبار ولا يعاملنا بما نستطيع ان نعمله .

د - مدرسنا يعتقد بأننا لا زلنا صغارا ولذلك يتوقع القليل أو الكثير منا كطلاب ومدرسنا لا يحاول ان يفهمنا ولا يهتم بآرائنا فى هذه المرحلة . هو يتضايق بسرعة ولا يرتاح لوجودنا حوله .

٤ : كيف يعامل ويفهم مدرسك الطلاب اللذين يعانون من مشاكل تصرفيه وسلوكية ؟

أ - مدرسنا ليس يقلق على الطلاب اللذين يسيئون التصرف او السلوك فى الفصل بالدرجة التى هو قلق على الطلاب المؤدبين.هو يحاول على التعرف على الاسباب التى تدفع الطلاب على عمل هذه التصرفات وساعدتهم على حل مشاكلهم .

ب - مدرسنا على علم بأن للطلاب مشاكل ويبحث عن الاسباب المؤدية لسوء التصرفات والسلوك هو يتوقع ان يسلكو الطلاب سلوكا حسنا حتى لو كان عندهم مشاكل واذا لزم الامر يقوم بمعاقبة الطلاب . .

جـ - مدرسنا لا يعلم بأن هناك اسباب تدفع الطلاب الى ان يتصرفوا بهذه التصرفات الغير لائقه وهو يعرف انه يجب عليه ان يتعرف على طلابه اكثر ولكنه فى المقابل يعاقب الطلاب .

د - مدرسنا لا يعلم بأن للطلاب مشاكل ويعامل الطلاب المشاغبين بنفس الطريقه وهو دائما يعاقب المشاغبين .

هـ - مدرسنا يعتقد بان الطلاب اللذين لا يطيعون الاوامر هم اكبر مشكلة فى الصف ويظن بأن الطالب الهادئ هو الطالب المثالي وهو لا يريد ان يفهم لماذا الطلاب يتصرفون بهذه التصرفات ويعاقب جميع الطلاب المشاغبين .

٥ : كيف ينظر الطلاب الى مدرسك ؟

أ - يستطيع الطلاب ان يتحدثون مع مدرسنا بكل جراءة - الطلاب مرتاحين للمدرس

ب - يحترم الطلاب مدرسنا ولكن لا يشعرون بالراحة عند التحدث معه شخصيا

جـ - معظم الطلاب مرتاح لمدرسنا ولديهم الرغبة فى عمل مايريده .

د - الطلاب لا يخافون أو يحترمون مدرسنا .

هـ - الطلاب يخافون مدرسنا ويحاولون ان يجتنبوه واذا اراد و اذائه فعلوا ذلك .

٦ : ماذا تعمل فى حصة العلوم ؟

أ - نتكلم عن مشاكل العلماء فى اكتشافاتهم للمبادئ والقواعد العلمية والحقائق وراء الاستنتاجات العلميه. مدرسنا يريد ان يعرف اذا لم نوافقة الرأى وفي الغالب تكون لدينا فرص للتحدث في موضوعات وافكار علمية. نقوم بعض الوقت بعمل التجارب والنشاطات بأنفسنا .

ب - نتحدث بعض الاوقات من المشاكل التى واجهت العلماء اثناء اكتشاف المبادى العلمية وكذلك نتحدث من الحقائق وراء الاستنتاجات العلمية. نقوم بعض الاوقات باجراء التجارب والنشاطات والبراهين بأنفسنا وكذلك نحن قادرين على مناقشة مايشرحه مدرسنا .

جـ - تحدثنا مرات قليله من المشاكل التى واجهت العلماء اثناء اكتشاف المبادئ العلمية ونقضى جزء من الحصه فى الاجابة علىاسئلة المدرس ، كذلك نقوم باجابه الاسئلة من الكتاب المدرسي المقرر كذلك نقوم بعمل بعض التجارب بانفرنا

د - نسأل اسئلة لتوضيح ماشرحه المدرس أوماقرنآه فى الكتاب المقرر ونقوم بمشاهدة بعض التجارب التى يقوم بعملها المدرس امامنا كذلك نقوم باجابة الاسئلة من الكتاب المدرسي ونجاوب اسئلة المدرس .

هـ - يجب علينا ان نقوم بنقل وحفظ مايقوله مدرسنا. معظم اسئلتنا تكون بهدف توضيح ماشرحه المدرس او مافى الكتاب المدرسي فى الغالب نقوم باجابة الاسئله من الكتاب المدرسي المقرر .

٧ : ماذا يعمل مدرسك فى الصف ؟

أ ـ يساعدنا مدرسنا على فهم الاهداف والاسباب وراء أى درس قبل ان نبدأ فيه ويلقي مدرسنا بعض الاسئلة من الافكار التى سبق وان درست وكذلك يسأل عن بعض الحقائق وراء الجمل والعبارات من الكتاب المقرر وكذلك يطالبنا بشرح بعض الرسوم البيانيه .

ب ـ يسألنا مدرسنا عن مواضيع سبق وان درسناها وكذلك يسأل عن بعض الحقائق وراء الجمل والعبارات من الكتاب المقرر وبعض الاوقات يطلب منا ان نشرح بعض الرسوم التخطيطيه والرسوم البيانيه .

جـ ـ يقضى مدرسنا معظم الوقت فى التحدث عن العلوم ويقوم بشرح واعادة مايشرحه الكتاب المقرر ويسألنا عن بعض المواضيع التى سبق وان درسناها .

د ـ يعيد مدرسنا مايحتويه الكتاب من اى موضوع واذا لم يتفق الطلاب فى الصف فان المدرس يخبر من الذى على الصواب . معظم الوقت يتحدث مدرسنا عن العلوم .

هـ ـ وضح مدرسنا لنا انه يمكن للعلم ان يجيب عن جميع الاسئلة المتعلقة بالعالم الطبيعي من حولنا واذا لم يتفق الطلاب يخبرهم بمن هو على صواب . مدرسنا يكرر ويردد ماتحتويه الكتب المدرسيه .

٨ : كيف يستخدم المدرس الكتاب المدرسي والمراجع ؟

أ ـ يتوقع مدرسنا ان نجد الافكار الرئيسية فى الكتب المقررة ويجب علينا البحث عن براهين لهذه الحقائق والافكار . يشرح المدرس كيفية استطلاع الافكار فى الكتب التى ندرسها. يخصص المدرس بعض الوقت لقرأة الصحف العلمية وبعض الكتب التى لها علاقه بالدرس .

ب ـ يتوقع مدرسنا ان نتعلم بعض الافكار بالتفصيل من الكتب المقرره ونستطيع ان نستخدم بعض المجلات والكتب العلمية فى الصف اذا اردنا . يشرح لنا المدرس كيفية استطلاع واستنتاج الافكار من الكتب المقررة .

جـ ـ يتوقع مدرسنا ان نتعلم الكثير من الافكار من الكتب المقرره بالتفصيل ونبحث عن بعض الافكار الرئيسية فى الكتب المقرره كذلك نجد بعض الحقائق التى تثبت هذه الافكار وفى بعض الاوقات نقوم بكتابة موجزة مختصرة لبعض الاجزاء من الكتاب

المدرسي المقرر . مذكرة المدرس وشرحه بالاضافة الى الكتاب المقرر هم المصادر الاساسيه للمواضيع التى ندرسها فى الصف .

د - يتوقع مدرسنا ان نقوم بتلخيص لبعض الاجزاء من الكتاب المدرسي وماتناقش فى الصف صادر من الكتاب المدرسي ومذكرات المدرس وشرحه ويجب علينا ان نتعلم معظم المواضيع المقررة فى الكتاب المدرسي بالتفصيل .

هـ - لا يحب مدرسنا ان يسألة الطلاب من اي معلومات من الكتاب المقرر. فالبا نكتب بعض التعاريف لبعض المصطلحات او الكلمات ويجب علينا ان نلخص بعض الاجزاء من الكتاب المقرر كذلك يجب علينا ان نغّيب ونحفظ معظم التفاصيل فى الكتاب المقرر .

٩ : ماهى كيفية امتحاناتك ؟ كيف هذه الامتحانات تُستخدم ؟

أ - تحتوى امتحاناتنا على الكثير من الاسئلة عن النشاطات المعملية وفى الغالب تتطلب منا الاسئلة ان نجد اجابة لبعض المسائل الجديدة بالنسبة لنا . بعض الاوقات نجد طرق للبحث عن اجابات لهذه الاسئلة ونقوم بعمل اشياء فى الامتحانات مثل التى تعلمنا ها فى المختبرات العلمية كالملاحظات وشرح النتائج .

ب - تحتوى امتحاناتنا على الكثير من الاسئلة عن النشاطات المعملية وفي الغالب تتطلب منا الامتحانات ان نجد اجابات لبعض الاسئلة الجديدة علينا . بعض الاوقات بعمل اشياء فى الامتحانات من التى تعلمناها في التجارب المختبريه مثل عمل الملاحظات وتفسير النتائج .

جـ - تتطلب امتحاناتنا بعض الاوقات بان نصف رسم توضيحى وقد تحتوى الامتحانات على اسئلة من النشاطات المعملية وبعض الاوقاتتتطلب الامتحانات منابأن تجاوب على اسئلة تتعلق بأفكار قد درست فى اوقات سابقة .

د - بعض الاوقات تتطلب الامتحانات ان نكتب بعض التعاريف للمصطلحات العلميه ووصف بعض الرسوم التوضيحية لا تتطلب الامتحانات منا استخدام الرياضيات .

هـ - غالبا تتطلب الامتحانات كتابة بعض التعاريف لبعض المصطلحات والكلمات وكفاية اسماء الاجزاء فى الاشكال المعطاه لا نستخدم رياضيات في اجابة اسئلة الامتحانات وليس لدينا فرصة لكي نتكلم عن الامتحان فى الصف بعد الانتهاء منه .

١٠ : ماذا تعمل فى المعمل ؟

أ - نناقش الاسباب التى تؤدى الى عمل اى نشاط معملي قبل ان نعمله ونحاول طرقنا الخاصة فى عمل اى نشاط فى المختبر وعند الانتهاء من النشاط فى المختبر يمكننا ان نقارن نتائجنا مع نتائج الاخرين ومسموح لنا ان نعمل التجارب بأنفسنا .

ب - نناقش الاسباب المؤدية الى عمل النشاطات المختبرية قبل ان نعملهما قد تكون النتائج التى يجمعها اى طالب مختلفة من النتائج التى يحصل عليها الطلاب الاخرون ومن المحتمل ان نقوم بعمل بعض التجارب بأنفسنا

جـ - فى بعض الاوقات نقوم بمناقشة الاسباب المؤدية الى عمل اى تجربة قبل ان نعملها ونقارن نتائجنا بنتائج الاخرين فى المعمل. اقل من ثلث الوقت المخصص للاحياء (حصص الاحياء) نقضية فى المختبر .

د - بعض الاوقات نعرف الاجابة من الاسئلة قبل عمل اى تجربة ومن النادر ان نناقش الاسباب المؤدية الى عمل هذه النشاطات ونقضى أقل من ربع وقت العادة فى عمل النشاطات المعملية .

هـ - ليس مسموح لنا بعمل اى نشاط بأنفسنا فى المختبر ونعرف الاجابه أو النتائج من التجربه قبل ان نعمل اى نشاط ولانتكلم عن الاسباب التى من اجلها نعمل التجربه ونقضى وقت قليل جدا فى عمل التجارب المختبريه .

* * *

Appendix J

Science Classroom Activity Checklist:

Teacher's Perceptions (SCACL:TP) -- English Version

The purpose of this checklist is to determine the types of activities which you feel should take place in your science classroom. The classroom, for this purpose is defined to include the laboratory. Each statement describes some classroom activity(ies). The activities are not judged as either good or bad ; therefore, this checklist is not a test and is not designed to evaluate you. You are to read each statement and decide if he statement true or false based on what you feel should take place in your science classroom.

SAMPLE QUESTION

Checklist	Answer sheet	T	F
1. All students should always wear laboratory aprons in the laboratory.	1.	( )	( )

If the statement describes what should occur in your science classroom, place an "X" in the space under the letter T (true) on the answer sheet; if it does not , place an "X" in the space under the letter F (false).

All of the statements must be responded to, so if a statement is not completely true or false you will have to decide whether it is more true than false or vice-versa and make mark accordingly.

All answers should be recorded in the answer sheet provided. NO MARKS should be made in the checklist.

There is no time limit for completing this checklist.

SCACL: TP

1. The student's role is to copy down and memorize what the teachers tells him/her.
2. Student should frequently be allowed time in class to talk among themselves about ideas in science.
3. Over 25% of the class time should be devoted to students answering orally or in writing answers to questions that are in the textbook or in study guides.
4. Classroom laboratory activities, such as experiments and demonstrations, should usually performed by students rather than by the teacher.
5. Science classes should provide for some discussion of the problem facing scientists in the discovery of a scientific principle.
6. If a student disagree with what the teacher says, he/she should say so.
7. Most questions students ask in class should be to clarify statements made by the teacher or the text.
8. It is important that students discuss the evidence behind a scientist's conclusion.
9. A majority of class time should be spent lecturing about science.
10. A teacher should be very hesitant to admit his/her mistakes.
11. A teacher should generally provide the answer when the students disagree during a discussion.
12. It is desirable for teachers to frequently repeat to their students almost exactly what is in the text.
13. A teacher should frequently cause students to explain the meanings of statements, diagram, graphs, etc.
14. Science should be presented as having almost all

of the answers to questions about the natural world.

15. Teacher questions should require students to think about ideas they have previously studied.

16. Teacher questions should force students to think about the evidence behind the statement that are made in the textbook.

17. The general objectives of a lesson should be understood by the students before work on the lesson begun.

18. Students should learn most of details stated in the text.

19. It is important that students frequently write out definitions to word lists.

20. When reading the textbook, students should be expected to look for the main problems (ideas) and for the evidence that support them.

21. Students should be taught how to ask themselves questions about statements in the text.

22. The text and the teacher's notes should provide about the only sources of scientific knowledge for class discussion.

23. Students should often read in sources of science information (books, magazine, etc.) other than textbook.

24. The student should often be required to keep outline notes on sections of the textbook.

25. The textbook is based on scientific fact and as such should not be questioned by students.

26. Tests should include many items based on what students have learned in their laboratory investigations.

27. Tests should often require writing out the definitions of terms.

28. Tests should often ask students to relate ideas that they have learned at different times.

29. Tests should often require the figuring out of answers to new problems.

30. Tests should provide data that the students have not seen previously and ask the students to draw conclusions from these data.

31. Test should often require students to put labels on drawings.

32. Student evaluation should include formal means of evaluating the performance of skills learned in laboratory activities; e.g. observation, interpretation of data, etc.

33. Tests should seldom contain problems which involve the use of mathematics in their solutions

34. Students should occasionally be given problems for which they must design ways of looking for solutions.

35. Students should occasionally be given research reports and asked to evaluate the procedures used in looking for solutions to the problem.

36. It is a waste of time after a test to have students discuss questions they have on the test.

37. Students should be told step-by-step what they are to do in the laboratory.

38. Student should spend time before most laboratory investigations in discussing the purpose of the experiment.

39. Equipment and solutions should not be gathered and/or prepared in advance of laboratory sessions

40. Science laboratories should meet on a regularly scheduled basis (such as every Saturday and Tuesday).

41. The laboratory should often be used to investigate a problem that comes up in class.

42. A laboratory should usually precede the discussion of the specific topic in class.

43. Laboratory activities should usually be related

to the topic that is being studied in class.

44. Students should know the answer to a laboratory problem that they are investigating before they begin the experiment.

45. Most laboratory activities should be done by the teacher or other students while the class watches.

46. It should be expect that the data collected by various members of a class will often be different for the same experiment.

47. During an experiment, student should record their data at the time they make their observations.

48. Student should sometimes be asked to design their own experiments to seek answers to a question that puzzles them.

49. Students often ask the teacher if they are getting the correct results in their experiments.

50. The teacher should answer most of the students' questions about laboratory work by asking the students questions.

51. One fourth or less of class time should be spent doing laboratory work.

52. Student should always be required to follow teacher or laboratory manual specified ways of doing laboratory work.

53. Laboratory should be directed at students throughly learning the names of specific structures and specific sequences of events.

54. Laboratory observations should be discussed within a day or two after the completion of the activity

55. After completion of a laboratory activity individual student or student groups should have an opportunity to compare data.

56. Students should be required to copy the purposes, materials, and procedures used in their experiments from the text or laboratory manual.

57. Students should be allowed to go beyond the regular laboratory exercise and do some experimenting of their own.

58. Student should have an opportunity to analyze the conclusions that they have drawn in the laboratory.

59. A class should be able to explain all unexpected data collected in the laboratory.

60. Students should spend time in the interpretation of graphs and tables of the data which they collected.

Appendix K

Science Classroom Activities Checklist: Teacher's Perception (SCACL:TP) -- Arabic Version

A translation of the English Version

قائمه النشاطات فى الصفوف العلميه كما يدركها او يفهمها المدرس

SCACL

الهدف من هذه القائمه هو تحديد نوع النشاطات التى تحس انها ولا بد ان تدرّس فى صفك وفي المختبر . كل عباره تصف نشاط أو نشاطات مفيه ولن يحكم عليها نشاطات جيده او غير جيده لذلك هذه القائمه ليست بأمتحان لك أو لتقويم نشاطاتك. المطلوب منك ان تقرأ هذه العبارات وتقرر اذا كانت صحيحه أم غير صحيحه بناء على احساسك بما يجب ان يحدث فى الصف والمختبر .

مثـــال :

١ - يجب على جميع الطلاب ان يلبسوا كوت المختبر (البالطو) فى المختبر

صح   خطأ

(✓)   (   )

اذا كانت العبارة تصف مايجب ان يتم فى صفك فاكتب علامه صح بين القوسين تحت كلمة صح فى ورقة الاجابه واذا كانت العبارة غير صحيحه اكتب علامة خطأ في المكان المخصص تحت كلمة خطأ في ورقة الاجابه .

الرجاء قرأة والاستجابه لجميع العبارات واذا كانت العبارة ليست صحيحه تماما او ليست بخطأ تماما فأجعل اجابتك بناء على ماتحس أنه اكثر صحة أُم خطأ

الرجاء ان تكون جميع الاجابات فى ورقة الاجابه المرفقه ولا تكتب في ورقة الاسئلة .

ملاحظه : هذا الاستبيان مُتبنى ومترجم من عمل وليم براون وبعد الاستئذان من الدكتور روبرت هاو - جامعة اوهايو الحكوميه .

١ - دور الطالب فى الصف أو المختبر هو القيام بنقل وحفظ مايقول المدرس.

٢ - يجب ان يسمح للطلاب بمناقشة بعض الافكار والحقائق العلميه فى الفصل .

٣ - يجب ان يخصص اكثر من ربع الحصه للطلاب ليتمكنوا من الاجابه شفويا او تحريريا على الاسئله الموجوده فى الكتاب المقرر .

٤ - يجب ان يقوم الطلاب بعمل النشاطات المختبريه مثل التجاربوالتجارب التوضيحيه بدلا من المدرس .

٥ - يجب ان تناقش حصص العلوم بعض المشاكل التى واجهت العلماء فى اكتشاف بعض المبادى والافكار العلميه .

٦ - اذا لم يوافق الطالب لما يقول المدرس . . هل بالامكان ان يقول الطالب ذلك ؟

٧ - يجب ان تكون معظم الاسئلة فى الصف اسئله توضيحيه لما شرحه المدرس أو لموضوع فى الكتاب المدرسي .

٨ - أنه من الاهمية ان يناقش الطلاب الدلائل والشواهد وراء الاستنتاجات العلميه

٩ - يجب ان يقضى مدرس العلوم الجزء الكبير من الحصه فى القاء وشرح المادة العلميه

١٠ - يجب على المدرس ان يكون مترددا فى قبول أو الاعتراف بأخطاءه .

١١ - يجب على المدرس ان يعطى الاجابه اذا كان احد الطلاب غير موافق على أى نقطه خلال المناقشه .

١٢ - انه من المفضل دائما ان يقوم المدرس بشرح مافي الكتاب تماما للطلاب .

١٣ - يجب على المدرس ان يقود الطلاب لشرح معانى بعض العبارات والرسوم التوضيحيه والجداول .

١٤ - يجب ان تعرض أو تقدم العلوم وكأنها تحتوى على الاجابه لجميع الاسئلة عن العالم الطبيعى .

١٥ - اسئلة المدرس يجب ان تتطلب من الطلاب التفكير فى مواضيع درست سابقا .

١٦ - يجب ان تفرض اسئلة المدرس على الطلاب ان يفكروا فى الشواهد أو الدلائل وراء العبارات فى الكتاب المدرسي .

١٧ - يجب ان يفهم الطلاب الاهداف العامه من أى درس قبل شرحه .

١٨ - يجب على الطلاب ان يتعلموا معظم التفاصيل الموجوده فى الكتاب المقرر .

١٩ - من الاهمية ان يقوم الطلاب بكتابة التعاريف للمصطلحات العلميه .

٢٠ - عند قرأة الكتاب المقرر يتوقع من الطلاب ان يبحثوا عن الافكار الرئيسية والشواهد التى تدعمها .

٢١ - يجب ان يدرّس الطلاب كيفية التأمل والتفكير فى العبارات والمواضيع فى الكتاب المدرسي .

٢٢ - يجب ان يكون الكتاب المقرر وشرح المدرس وتحضيره المصادر الاساسيه للمعرفه العلميه فى المناقشه الصفيه .

٢٣ - يجبعلى الطلاب قرأة الكتب والمجلات العلميه بالاضافة الى الكتاب المدرسي .

٢٤ - يجب ان يطلب من الطلاب كتابة ملخص من بعض الاجزاء من الكتاب المدرسي .

٢٥ - الكتاب المدرسي مبني على حقائق علميه وبناء على ذلك فانه يجب على الطلاب عدم مناقشة ذلك .

٢٦ - يجب ان يكون العديد من الاسئلة فى الامتحان مبنية على ماتعلمه الطلاب في المختبر .

٢٧ - يجب ان يحتوى الامتحان على كتابة بعض التعاريف للمصطلحات العلميه .

٢٨ - فيالغالب يجب ان تتطلب الامتحانات من الطلاب ربط ماتعلموه فى اوقات مختلفه

٢٩ - فى الغالب يجب ان تتطلب الامتحانات من الطلاب ان يجدوا اجابات لبعض المسائل الجديده عليهم .

٣٠ - يجب ان تحتوى الامتحانات على معلومات لم يراها الطلاب من قبل ويطلب منهم كتابة مايستنتجوه من هذه المعلومات .

٣١ - يجب ان تتطلب الامتحانات من الطلاب كتابة اسماء بعض الاجزاء فى الاشكال والرسوم التوضيحيه .

٣٢ - يجب ان تحتوى على اسئلة بهدف التعرف على المهارات التى تعلموها من النشاطات المعمليه مثل الملاحظه وتفسير الظواهر وغيرها .

٣٣ - يجب ان لاتحتوى الامتحانات على اسئلة تتطلب من الطلاب استخدام الرياضيات

٣٤ - يجب ان يعطى الطلاب احيانا مسائل تتطلب منهم تصميم وسائل أو طرق ليتمكنوا من حل هذه المسائل .

٣٥ - يجب ان يعطى الطلاب بحثا ويطلب منهم تقويم الخطوات التى استخدمت فى حل هذا البحث .

٣٦ - انه مضيعة للوقت عندما يعطى الطلاب وقت بعد الامتحان لمناقشة اسئلة ذلك الامتحان .

٣٧ - يجب ان يعلّم الطلاب خطوه خطوه بماذا يجب ان يعملوه فى المختبر .

٣٨ - يجب ان يقضى الطلاب الوقت لمناقشة الهدف من التجارب المعملية قبل القيام بها .

٣٩ - يجب ان لاتحضّر الادوات والمحاليل قبل بداية النشاط فى المختبر .

٤٠ - يجب ان تكون المختبرات فى ايام محدده مثل يوم السبت والثلاثاء .

٤١ - فى الغالب يجب ان يستخدم المعمل لدراسة وتحقيق اى مشكلة تظهر فى الفصل

٤٢ - يجب ان تسبق النشاطات فى المختبر المناقشه الصفيه فى موضوعات معينه .

٤٣ - دائما يجب ان تكون التجارب فى المختبر عائدة على مواضيع سبق وان شرحت فى الصف .

٤٤ - دائما يجب ان يعرف الطلاب النتائج او الحلول للتجارب التى يعملونها فى المختبر قبل البداية في دراستها فى المختبر .

٤٥ - يجب ان المدرس أو احد الطلاب يعمل التجربه امام الطلاب بينما الطلاب يشاهدون التجربه .

٤٦ - يجب ان يتوقع مدرس العادة ان المعلومات أو نتائج الطلاب غالبا ماتكون مختلفه حتى ولو فى نفس التجربه .

٤٧ - اثناء التجربه يجب على الطلاب تجميع المعلومات فى الوقت الذى يشاهدوا فيه التجربه .

٤٨ - بعض الاوقات يجب ان يطلب من الطلاب تصميم تجاربهم للاجابة عن بعض الاسئلة المحيّرة

٤٩ - غالبا يجب ان يسأل الطلاب مدرسهم عن صحة المعلومات التى حصلوا عليها فى المعمل .

٥٠ - يجب على المدرس باجابة معظم اسئلة الطلاب المتعلقة بالمختبر عن طريق القاء اسئلة على الفصل .

٥١ - يجب ان يخصص ربع الحصه أو أقل للتجارب فى المختبر .

٥٢ - يجب ان يتبع الطلاب ارشادات المدرس أو كتاب النشاطات عند العمل فى المختبر

٥٣ - يجب ان تكون المختبرات والتجارب موجهه بهدف تعلم الطلاب لاسماء تراكيب واجزاء والتسلسل فى الاحداث .

٥٤ - يجب ان تناقش الملاحظات والمشاهده الناتجه من التجارب بعد الانتهاء من النشاط بيوم أو يومين .

٥٥ - بعد الانتهاء من التجارب المعملية يمكن للطلاب أو مجاميع الطلاب مقارنه النتائج التى حصلوا عليها .

٥٦ - يجب ان يطلب من الطلاب نقل وكتابة الهدف من التجربه والادوات والمواد وخطوات العمل التى استخدموها فى تجاربهم من الكتاب أو من كتاب النشاطات .

٥٧ - يجب ان يسمح للطلاب بالبقاء بعد انتهاء وقت المعمل للعمل فى تجاربهم الخاصه .

٥٨ - يجب ان يكون هناك فرصه للطلاب لكي يحللوا النتائج والاستنتاجات التى حصلوا عليها من النشاطات التى قاموا بها

٥٩ - يجب ان يكون الطلاب قادرين على شرح معلومات غير متوقعه جمعت فى المعمل .

٦٠ - يجب أن يقضى الطلاب بعض الوقت لشرح بعض الرسوم التوضيحيه والاشكال ، والجداول التى حصلوا عليها فى المعمل .

* * *

Appendix L

School Information Questionnaire -- English Version

School Name: ....

Educational District: ....

Total Enrollment: ....

Number of Classes: ....

Number of Science Classes: ....

Number of Students in Science Classes: ....

School Location:

1. Inner city 2. Suburban

3. Village

Establishment Date; ....

Number of Graduted in the Past Year: ....

Number of New Students in the 10th grade: ....

Number of New Students in the science classes: ....

Type of building:

1. Governemental 2. Rented

Appendix M

School Information Questionnaire -- Arabic Version

معلومات عن المدارس الثانوية فى المنطقة الجنوبية الغربية

اسم المدرسه : ....

المنطقة التعليمية التابع لها : ....

عدد الطلاب الكلي فى المدرسة : ....

عدد الفصول فى المدرسة : ....

عدد الفصول العلمية فى المدرسة : ....

عدد الطلاب فى الصفوف العلميه : ....

موقع المدرسه : ....

١ - داخل المدينة ٢ - فى ضاحية المدينه

٣ - فى قريه

تاريخ تأسيس المدرسه : ....

عدد الطلاب الناجحين فى العام الماضى فى السنه الثالثه : ....

عدد الطلاب المقبولين فى العام الحالى للصف الاول : ....

عدد الطلاب الجدد فى المدرسه (الصفوف العلمية) ....

نوع البنايه للمدرسه : ــــــ ....

١ - حكوميه ٢ - مستأجره

Appendix N

Categories and Codings of All Variables

VARIABLES	Code
District No. 1	DISD1
District No. 2	DISD2
District No. 3	DISD3
District No. 4	DISD4
District No. 5	DISD5
School No. 1	SID1
School No. 2	SID2
School No. 3	SID3
School No. 4	SID4
School No. 5	SID5
School No. 6	SID6
School No. 7	SID7
School No. 8	SID8
School No. 9	SID9
School No. 10	SID10
School No. 11	SID11
School No. 12	SID12
School No. 13	SID13
School No. 14	SID14
School No. 15	SID15
School No. 16	SID16
School No. 17	SID17
STUDENT'S CHARACTERISTICS	
Age interval 1 (17 - 19) years	AGST1
Age interval 2 (20 - 22) years	AGST2
Father's Education	
Can not read or write	FD1
No formal education, but can read only	FD2
No formal education, but can read and write	FD3
Elementary school	FD4
Junior high school	FD5

Secondary school	FD6
College degree	FD

Father's Occupation

Businessman	FAOC1
Farmer	FAOC3
Work in the medical field	FAOC4
Work in the military	FAOC5
Teacher	FAOC6
Not working	FAOC7
Governmental employee	FAOC8
Other	FAOC9

Mother's Education

Can not read or write	MD1
No formal education, but can read only	MD2
No formal education, but can read and write	MD3
Elementary school	MD4
Junior high school	MD5
Secondary school	MD6
College degree	MD

Reasons for Selecting Science Field

Friend influence	RE1
Personal decision	RE2
Parent decision	RE3
Better job opportunities	RE4
Good reputation in the society	RE5
Good science grades	RE6
Nationality of the Student	NATST
Having older brothers or sisters	BN
Number of brothers or sisters going to college	BROTHED
Considering Science Teaching as a career	TEACSCI
Years at the Secondary School Level	YEARNO
Interest in Biology	INT1
Interest in Chemistry	INT2
Interest in Physics	INT3
Intreset in Geology	INT4
Past interest in Biology	PASTINT1
Past interest in Chemistry	PASTINT2
Past interest in Physics	PASTINT3
Past interest in Geology	PASTINT4
Mean score of Arabic grammar	MARABG
Mean score of Arabic literature	MARABL
Mean CAST	MCAST

Mean biology scores	MABAT
Mean mathematics score	MATHM
TEACHER'S CHARACTERISTICS	
Age interval (20 - 29)	AGET1
Age interval (30 - 39)	AGET2
Age interval (40 - 49)	AGET3
Subjects a Teacher Teaches	
Biology	WHATEA1
Physics	WHATEA2
Chemistry	WHATEA3
Years of Science Teaching	
Two years	YEARTEA2
Three years	YEARTEA3
More than three years	YEARTEA4
Degree	
Bachelor degree	DEGREE1
Master degree	DEGREE2
Reason for Selecting Science Teaching	
Science reputation in the society	WHYTE1
Job opportunities	WHYTE2
Science is easy	WHYTE3
Science is interesting	WHYTE4
Others	WHYTE5
Major Influence in Selecting Science Teaching as a Profession	
Friend influence	DECTEA1
Personal decision	DECTEA2
Parents	DECTEA3
Salary	DECTEA4
Others	DECTEA5
Average Number of Students in Science Classroom	
16 - 20	STUNOCL2
21 - 25	STUNOCL3
26 - 30	STUNOCL4
31 - 35	STUNOCL5
More than 35	STUNOCL6
Number of Science Classes a week that a Teacher Teachs	
10 - 14	CLWEEK2

15 - 19	CLWEEK3
20 - 24	CLWEEK4
Adequacy of Material and Equipment for Teaching Science involving Different Instructional Strategies	
Very Abundant	EQUAVA1
Abundant	EQUAVA2
Little	EQUAVA3
Scientific Equipment and Supplies Adequacy in Schools	MATADQ
Problem in Science Teaching as Viewed by Science Teachers	
Lack of inservice training	TEAOPN1
Inadequate facilities	TEAOPN2
Lack of scientific equipment and supplies	TEAOPN3
Lack of teacher planning time	TEAOPN4
Teachers are not prepared to teach science	TEAOPN5
Lack of interest in teaching	TEAOPN6
Mean SCACL	MSCACL
Nationality of teacher	NATT
SCHOOL VARIABLES	
Enrollment	ENROLL
Number of classes in a school	CLASNO
Number of science classes	SCLASS
Number of science students	SCIST
New student (10th grade)	NEWST
Number of student graduated in last year	GRADST
Inner city school	LOCAT1
Suburb school	LOCAT2
Village school	LOCAT3
Establishment date	ESTBDATE
Type of Building	
Governemental	BUILD1
Rented	BUILD2
Ratio of teachers to total students	STTOTRAT

Appendix O

Variables listed horizontally in Appendix O are in the same order as in Appendix N.

To use Appendix O, you need to look for the first variable in the horizontal list and look down vertically for the second variable. If the second variable is not found in the vrtical list, find the second variable in the horizontal list and then search vertically down for the first variable.

Example:

If you look for the correlation value between WHYTE1 and INT1, find WHYTE1 in the horizontal list and look vertically down for INT1. If INT1 is not found, find INT1 in the horizotal list and look vertically down for WHYTE1.

Duplicate correlations were not printed to reduce the number of pages in the dissertation.

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              DISD1       DISD2       DISD3       DISD4       DISD5       SID1

NATST          .0664      -.2331       .0354       .0156       .1494       .1282
             (  912)     (  912)     (  911)     (  912)     (  912)     (  912)
             P= .023     P= .000     P= .143     P= .319     P= .000     P= .000

BN             .0104      -.0741       .0516       .0169       .0158       .0580
             (  911)     (  911)     (  910)     (  911)     (  911)     (  911)
             P= .377     P= .013     P= .060     P= .305     P= .317     P= .040

BROTHED        .0782      -.0643       .0670      -.0399      -.0335       .0369
             (  911)     (  911)     (  910)     (  911)     (  911)     (  911)
             P= .009     P= .026     P= .022     P= .115     P= .156     P= .133

TEACSCI        .0384      -.0480       .0185      -.0662       .0661       .0342
             (  911)     (  911)     (  910)     (  911)     (  911)     (  911)
             P= .123     P= .074     P= .289     P= .023     P= .023     P= .151

YEARNO         .0655       .0407       .0435      -.0793      -.0817       .1088
             (  911)     (  911)     (  910)     (  911)     (  911)     (  911)
             P= .024     P= .110     P= .095     P= .008     P= .007     P= .001

INT1          -.0908       .0886       .0198       .0015      -.0064       .0086
             (  909)     (  909)     (  908)     (  909)     (  909)     (  909)
             P= .003     P= .004     P= .275     P= .482     P= .424     P= .398

INT2          -.0843       .0045       .0736      -.0510       .1037      -.1389
             (  908)     (  908)     (  907)     (  908)     (  908)     (  908)
             P= .006     P= .446     P= .013     P= .062     P= .001     P= .000

INT3           .0443       .0811       .0144      -.1302      -.0229       .0064
             (  909)     (  909)     (  908)     (  909)     (  909)     (  909)
             P= .091     P= .007     P= .332     P= .000     P= .246     P= .424

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              DISD1       DISD2       DISD3       DISD4       DISD5       SID1

INT4         -.1317       .0402      -.0157       .0881       .0387      -.0749
            (  910)     (  910)     (  909)     (  910)     (  910)     (  910)
            P= .000     P= .113     P= .319     P= .004     P= .121     P= .012

PASTINT1     -.1403       .0896       .0207       .0322       .0237      -.0427
            (  911)     (  911)     (  910)     (  911)     (  911)     (  911)
            P= .000     P= .003     P= .266     P= .166     P= .238     P= .099

PASTINT2     -.0871       .0172       .0550       .0477      -.0033      -.1104
            (  909)     (  909)     (  908)     (  909)     (  909)     (  909)
            P= .004     P= .302     P= .049     P= .076     P= .460     P= .000

PASTINT3      .0100      -.0107       .0557      -.0100      -.0330      -.0275
            (  909)     (  909)     (  908)     (  909)     (  909)     (  909)
            P= .381     P= .373     P= .047     P= .381     P= .160     P= .203

PASTINT4     -.0985       .0188      -.0175       .0699       .0423      -.0660
            (  907)     (  907)     (  906)     (  907)     (  907)     (  907)
            P= .001     P= .286     P= .299     P= .018     P= .101     P= .024

MARABG       -.1027      -.1151       .1178       .0027       .1783      -.1311
            (  912)     (  912)     (  911)     (  912)     (  912)     (  912)
            P= .001     P= .000     P= .000     P= .467     P= .000     P= .000

MARABL       -.0736      -.0755       .1575      -.0757       .1477      -.2238
            (  912)     (  912)     (  911)     (  912)     (  912)     (  912)
            P= .013     P= .011     P= .000     P= .011     P= .000     P= .000

MCAST        -.0882       .1805      -.0681      -.0763       .0365      -.1771
            (  912)     (  912)     (  911)     (  912)     (  912)     (  912)
            P= .004     P= .000     P= .020     P= .011     P= .136     P= .000

MABAT        -.0223      -.0177      -.0320       .0752      -.0068      -.0883
            (  912)     (  912)     (  911)     (  912)     (  912)     (  912)
            P= .250     P= .297     P= .167     P= .012     P= .419     P= .004

MATHM        -.1472      -.1472      -.0023       .0677       .2995      -.1047
            (  912)     (  912)     (  911)     (  912)     (  912)     (  912)
            P= .000     P= .000     P= .472     P= .021     P= .000     P= .001

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

               DISD1       DISD2       DISD3       DISD4       DISD5       SID1

MATADQ        -.0043      -.1876      -.1839       .1870       .1715      -.0151
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .448     P= .000     P= .000     P= .000     P= .000     P= .326

TEAOPN1        .2212       .0276      -.3024      -.1391       .0738       .1746
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .000     P= .204     P= .000     P= .000     P= .013     P= .000

TEAOPN2        .0232      -.1999       .1989      -.0372       .0950       .2225
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .243     P= .000     P= .000     P= .132     P= .002     P= .000

TEAOPN3        .0019      -.1625       .0266      -.0040       .1779      -.1822
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .477     P= .000     P= .212     P= .452     P= .000     P= .000

TEAOPN4       -.0091      -.1164      -.2063       .2728       .0137      -.0210
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .392     P= .000     P= .000     P= .000     P= .340     P= .264

TEAOPN5       -.0468      -.1725       .0230       .2602      -.0377      -.1132
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .080     P= .000     P= .245     P= .000     P= .129     P= .000

TEAOPN6       -.1205       .1630       .0777       .1588      -.2792      -.3275
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .000     P= .000     P= .010     P= .000     P= .000     P= .000

MSCACL        -.1384       .2080      -.1743       .0611      -.0009      -.0544
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .000     P= .000     P= .000     P= .033     P= .489     P= .051

NATT          -.0628      -.1799       .1897       .0240       .1222      -.0980
              ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
              P= .030     P= .000     P= .000     P= .235     P= .000     P= .002

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              DISD1       DISD2       DISD3       DISD4       DISD5       SID1

ENROLL        .1116      -.1663       .1853      -.0128      -.0773       .1028
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .350     P= .010     P= .001

CLASNO        .0412      -.0730       .1009       .0133      -.0604       .0436
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .108     P= .014     P= .001     P= .345     P= .035     P= .095

SCLASS       -.3121       .1815      -.0559      -.0293       .2642      -.2670
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .047     P= .190     P= .000     P= .000

SCIST        -.2624       .0875      -.0406       .0116       .2556      -.1160
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .004     P= .111     P= .364     P= .000     P= .000

NEWST         .1367      -.2542       .0060      -.0774       .2114       .1128
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .428     P= .010     P= .000     P= .000

GRADST       -.1793      -.2504      -.0711       .1387       .4399      -.1851
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .016     P= .000     P= .000     P= .000

LOCAT1        .0712      -.5507       .1950       .1414       .2623       .1669
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .016     P= .000     P= .000     P= .000     P= .000     P= .000

LOCAT2       -.0596       .3919      -.1556      -.0578      -.2092      -.1331
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .037     P= .000     P= .000     P= .041     P= .000     P= .000

LOCAT3       -.0298       .3319      -.0932      -.1475      -.1253      -.0797
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .185     P= .000     P= .003     P= .000     P= .000     P= .008

ESTBDATE     -.0966       .0052      -.0102       .1077       .0080       .2783
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .002     P= .438     P= .380     P= .001     P= .405     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             DISD1       DISD2       DISD3       DISD4       DISD5       SID1

BUILD1        .2344       .1278       .2265      -.0577      -.5770       .1938
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .041     P= .000     P= .000

BUILD2       -.2344      -.1278      -.2265       .0577       .5770      -.1938
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .041     P= .000     P= .000

STTOTRAT      .0831       .3166      -.2537       .0043      -.2951       .0145
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .006     P= .000     P= .000     P= .449     P= .000     P= .332

             SID2        SID3        SID4        SID5        SID6        SID7

NATST        -.0017      -.0405       .0872       .0042      -.0715      -.0309
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .480     P= .111     P= .004     P= .449     P= .015     P= .176

BN           -.0529      -.0128       .0966      -.0309      -.0439      -.0452
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .055     P= .349     P= .002     P= .176     P= .093     P= .086

BROTHED       .0810       .0066      -.0243       .0113       .0587      -.0019
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .007     P= .421     P= .232     P= .366     P= .038     P= .477

TEACSCI      -.0266       .0250       .0845      -.0123      -.0306      -.0056
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .211     P= .225     P= .005     P= .355     P= .178     P= .433

YEARNO        .0859       .0154      -.0210      -.0213      -.0079      -.0732
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .005     P= .321     P= .263     P= .260     P= .406     P= .014

INT1         -.1132       .0315      -.0427      -.0363      -.0094       .0119
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .000     P= .171     P= .099     P= .137     P= .388     P= .360

INT2         -.0621      -.0055       .0047       .0140      -.0040       .0479
            (  908)     (  908)     (  908)     (  908)     (  908)     (  908)
            P= .031     P= .435     P= .444     P= .337     P= .452     P= .075

INT3         -.0089       .0183       .0447      -.0041       .0132       .0205
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .394     P= .291     P= .089     P= .451     P= .346     P= .269

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              SID2        SID3        SID4        SID5        SID6        SID7

INT4         -.1164      -.0445       .0260       .0009      -.0918       .0077
            (  910)     (  910)     (  910)     (  910)     (  910)     (  910)
            P= .000     P= .090     P= .217     P= .489     P= .003     P= .409

PASTINT1     -.0967       .0407      -.0636      -.0552      -.0739       .0225
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .002     P= .110     P= .028     P= .048     P= .013     P= .249

PASTINT2     -.0562      -.0261      -.0191      -.0234      -.0079       .0977
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .045     P= .216     P= .283     P= .240     P= .406     P= .002

PASTINT3     -.0544      -.0293       .0487       .0331      -.0077       .0695
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .051     P= .188     P= .071     P= .160     P= .408     P= .018

PASTINT4     -.1108      -.0244       .0364       .0162      -.0647       .0029
            (  907)     (  907)     (  907)     (  907)     (  907)     (  907)
            P= .000     P= .232     P= .137     P= .313     P= .026     P= .465

MARABG       -.0515      -.0796      -.0481       .0611       .1000      -.0388
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .060     P= .008     P= .073     P= .033     P= .001     P= .121

MARABL       -.0830      -.0613       .0622      -.0092       .1217       .0739
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .006     P= .032     P= .030     P= .391     P= .000     P= .013

MCAST        -.0668      -.0522       .0706       .0208      -.0263       .0463
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .022     P= .058     P= .016     P= .266     P= .214     P= .081

MABAT        -.1639      -.0420       .1874      -.0392       .0046       .0459
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .000     P= .103     P= .000     P= .118     P= .445     P= .083

MATHM        -.4575      -.0107       .1519      -.0194       .0855       .1059
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .000     P= .374     P= .000     P= .279     P= .005     P= .001

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
---- PEARSON CORRELATION COEFFICIENTS -

            SID2      SID3      SID4      SID5      SID6      SID7

MATADQ     -.1601     .2277    -.1788     .1945     .1112     .0832
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .000   P= .000   P= .000   P= .000   P= .000   P= .006

TEAOPN1    -.0393    -.0280     .0072     .1547     .1579     .1290
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .119   P= .200   P= .414   P= .000   P= .000   P= .000

TEAOPN2    -.1814    -.0239    -.0662    -.0721     .1142     .0874
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .000   P= .236   P= .023   P= .015   P= .000   P= .004

TEAOPN3     .0849     .0513    -.0446    -.1044     .1070     .1813
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .005   P= .062   P= .090   P= .001   P= .001   P= .000

TEAOPN4    -.0808     .0684     .1567    -.0988    -.0983     .0114
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .008   P= .020   P= .000   P= .001   P= .002   P= .366

TEAOPN5    -.1116     .0079    -.0880     .1138     .2267    -.0026
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .000   P= .407   P= .004   P= .000   P= .000   P= .468

TEAOPN6    -.1992     .2269    -.0289    -.0072     .1855     .1445
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .000   P= .000   P= .193   P= .414   P= .000   P= .000

MSCACL     -.0364    -.2005     .0377    -.0488    -.1464     .0568
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .137   P= .000   P= .129   P= .071   P= .000   P= .044

NATT        .1652    -.2207     .0407     .0939    -.3099     .0916
           ( 903)    ( 903)    ( 903)    ( 903)    ( 903)    ( 903)
           P= .000   P= .000   P= .111   P= .002   P= .000   P= .003

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              SID2        SID3        SID4        SID5        SID6        SID7

ENROLL        .1181      -.3860       .6095      -.0705      -.3420      -.3327
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .017     P= .000     P= .000

CLASNO        .0443      -.4847       .5069       .1416      -.2537      -.3728
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .092     P= .000     P= .000     P= .000     P= .000     P= .000

SCLASS       -.0878      -.3164       .3127       .0546      -.3165      -.3546
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .004     P= .000     P= .000     P= .050     P= .000     P= .000

SCIST         .0825      -.3391       .2265      -.0899      -.3726      -.3450
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .007     P= .000     P= .000     P= .003     P= .000     P= .000

NEWST         .2019      -.3381       .5171      -.0461      -.3889      -.2501
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .083     P= .000     P= .000

GRADST        .0134      -.2741       .2967       .1725      -.3323      -.3561
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .343     P= .000     P= .000     P= .000     P= .000     P= .000

LOCAT1        .1699      -.2147       .1896       .0965      -.3014      -.2406
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .002     P= .000     P= .000

LOCAT2       -.1355       .2692      -.1513      -.0770       .3779      -.0751
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .010     P= .000     P= .012

LOCAT3       -.0811      -.0401      -.0906      -.0461      -.0563       .5037
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .007     P= .114     P= .003     P= .083     P= .045     P= .000

ESTBDATE     -.7564       .2544      -.1136       .1829       .1165       .1784
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .000     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

              SID2       SID3       SID4       SID5       SID6       SID7

BUILD1        .1973      .0976      .2203     -.2124     -.2595      .1093
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .002    P= .000    P= .000    P= .000    P= .000

BUILD2       -.1973     -.0976     -.2203      .2124      .2595     -.1093
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .002    P= .000    P= .000    P= .000    P= .000

STTOTRAT     -.1652      .6502     -.2514      .1447      .1630      .0636
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .000    P= .000    P= .028


              SID8       SID9       SID10      SID11      SID12      SID13

NATST        -.1420     -.1166     -.1067      .0621     -.0336      .0181
            (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
            P= .000    P= .000    P= .001    P= .030    P= .156    P= .293

BN           -.0741     -.0145     -.0185      .0580      .0035      .0272
            (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
            P= .013    P= .331    P= .289    P= .040    P= .458    P= .206

BROTHED      -.0070     -.0694     -.0354      .0734      .0053      .0277
            (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
            P= .417    P= .018    P= .143    P= .013    P= .437    P= .202

TEACSCI      -.0183     -.0585     -.0040      .0031      .0315     -.0080
            (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
            P= .290    P= .039    P= .452    P= .463    P= .171    P= .405

YEARNO       -.0901      .1564      .0370      .0294      .0330     -.0777
            (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
            P= .003    P= .000    P= .133    P= .188    P= .160    P= .010

INT1          .0570      .0398      .0409      .0737     -.0821      .0177
            (  909)    (  909)    (  909)    (  909)    (  909)    (  909)
            P= .043    P= .115    P= .109    P= .013    P= .007    P= .297

INT2         -.0452      .0356      .0312      .0713      .0210      .0198
            (  908)    (  908)    (  908)    (  908)    (  908)    (  908)
            P= .087    P= .142    P= .174    P= .016    P= .264    P= .276

INT3          .1544      .0321     -.0859     -.0222      .0628     -.0480
            (  909)    (  909)    (  909)    (  909)    (  909)    (  909)
            P= .000    P= .166    P= .005    P= .252    P= .029    P= .074

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              SID8       SID9       SID10      SID11      SID12      SID13

INT4          .1103     -.0195     -.0522     -.0145     -.0057      .1427
            (  910)    (  910)    (  910)    (  910)    (  910)    (  910)
            P= .000    P= .279    P= .058    P= .331    P= .432    P= .000

PASTINT1      .0380      .0340      .0715      .0473     -.0388      .0530
            (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
            P= .126    P= .152    P= .015    P= .077    P= .121    P= .055

PASTINT2      .0126      .0142      .0001      .0500      .0217      .1106
            (  909)    (  909)    (  909)    (  909)    (  909)    (  909)
            P= .352    P= .334    P= .499    P= .066    P= .257    P= .000

PASTINT3      .0169      .0079     -.0463      .0212      .0694      .0974
            (  909)    (  909)    (  909)    (  909)    (  909)    (  909)
            P= .305    P= .406    P= .082    P= .261    P= .018    P= .002

PASTINT4      .0270      .0339     -.0333     -.0165     -.0059      .1011
            (  907)    (  907)    (  907)    (  907)    (  907)    (  907)
            P= .208    P= .154    P= .158    P= .310    P= .430    P= .001

MARABG       -.0683      .1369     -.2334      .0969      .0632      .0245
            (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
            P= .020    P= .000    P= .000    P= .002    P= .028    P= .230

MARABL       -.0947      .1137     -.1128      .1686      .0203      .0270
            (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
            P= .002    P= .000    P= .000    P= .000    P= .270    P= .207

MCAST         .2604      .1221     -.1339     -.0615     -.0278      .0378
            (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
            P= .000    P= .000    P= .000    P= .032    P= .201    P= .127

MABAT        -.0850     -.0494      .1217      .0099     -.0779     -.0628
            (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
            P= .005    P= .068    P= .000    P= .383    P= .009    P= .029

MATHM        -.0550     -.1727     -.0197      .0046     -.0128      .0132
            (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
            P= .049    P= .000    P= .276    P= .445    P= .349    P= .345

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

              SID8       SID9       SID10      SID11      SID12      SID13

MATADQ       -.2151      .1288     -.1642     -.1559     -.0910     -.0034
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .000    P= .003    P= .459

TEAOPN1       .0067     -.0341      .0691     -.2565     -.1497     -.0903
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .420    P= .153    P= .019    P= .000    P= .000    P= .003

TEAOPN2      -.3262      .1324     -.0496      .1026      .2068     -.1445
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .068    P= .001    P= .000    P= .000

TEAOPN3      -.2947      .1378     -.0313     -.0474      .1278     -.0451
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .174    P= .077    P= .000    P= .088

TEAOPN4      -.3942      .0731      .2292     -.1977     -.0648      .0370
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .014    P= .000    P= .000    P= .026    P= .133

TEAOPN5      -.2163     -.0158     -.0049     -.0866      .1855      .1093
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .317    P= .442    P= .005    P= .000    P= .001

TEAOPN6      -.0764      .3308      .0643     -.0697      .2607      .0715
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .011    P= .000    P= .027    P= .018    P= .000    P= .016

MSCACL        .4124     -.0122     -.1543     -.2133      .0211      .0939
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .357    P= .000    P= .000    P= .263    P= .002

NATT         -.3979      .0273      .1695      .1609      .0939      .0295
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .207    P= .000    P= .000    P= .002    P= .188

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

                 SID8        SID9        SID10       SID11       SID12       SID13

ENROLL           .0683      -.3176      -.0720       .3036      -.1484      -.0064
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .020     P= .000     P= .015     P= .000     P= .000     P= .424

CLASNO           .0596      -.1491      -.0596       .2427      -.2076       .0506
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .037     P= .000     P= .037     P= .000     P= .000     P= .064

SCLASS           .3762      -.0816      -.0901       .0936      -.2590       .1097
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .000     P= .007     P= .003     P= .002     P= .000     P= .000

SCIST            .3418      -.2747      -.0271       .1194      -.2723       .1725
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .000     P= .000     P= .208     P= .000     P= .000     P= .000

NEWST           -.1382      -.3315       .0508       .1684      -.2647      -.2746
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .000     P= .000     P= .064     P= .000     P= .000     P= .000

GRADST          -.0836      -.1750      -.1544       .0622      -.2361       .2167
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .006     P= .000     P= .000     P= .031     P= .000     P= .000

LOCAT1          -.5829      -.4031       .1742       .1654       .0965       .1937
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .000     P= .000     P= .000     P= .000     P= .002     P= .000

LOCAT2           .7309      -.1258      -.1390      -.1319      -.0770      -.1545
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .000     P= .000     P= .000     P= .000     P= .010     P= .000

LOCAT3          -.1090       .8441      -.0832      -.0790      -.0461      -.0925
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .001     P= .000     P= .006     P= .009     P= .083     P= .003

EST8DATE         .0184       .2273      -.2229      -.1366       .2047      -.1161
              (   903)    (   903)    (   903)    (   903)    (   903)    (   903)
              P= .290     P= .000     P= .000     P= .000     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              SID8        SID9        SID10       SID11       SID12       SID13

BUILD1        .2650      -.3471       .2024       .1921       .1121       .2250
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .000     P= .000     P= .000

BUILD2       -.2650       .3471      -.2024      -.1921      -.1121      -.2250
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .000     P= .000     P= .000

STTOTRAT      .0198       .4223       .1177      -.1998      -.1507       .1080
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .276     P= .000     P= .000     P= .000     P= .000     P= .001


              SID14       SID15       SID16       SID17       AGST1       AGST2

NATST        -.0081       .0191       .1013       .1080       .0566      -.1003
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .403     P= .282     P= .001     P= .001     P= .044     P= .001

BN           -.0309       .0432       .0280      -.0143      -.0372      -.0103
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .175     P= .096     P= .200     P= .333     P= .131     P= .379

BROTHED      -.0471      -.0644      -.0460       .0105       .0372      -.0273
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .078     P= .026     P= .083     P= .375     P= .131     P= .206

TEACSCI      -.0758      -.0214       .0177       .0882      -.0367       .0013
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .011     P= .260     P= .297     P= .004     P= .134     P= .484

YEARNO       -.0549       .0307      -.0849      -.0151      -.3757       .4129
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .049     P= .177     P= .005     P= .325     P= .000     P= .000

INT1         -.0489       .0514       .0449      -.0780       .0404      -.0843
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .070     P= .061     P= .088     P= .009     P= .112     P= .006

INT2         -.0881      -.0126       .0884       .0479       .0637      -.0505
            (  908)     (  908)     (  908)     (  908)     (  908)     (  908)
            P= .004     P= .353     P= .004     P= .075     P= .027     P= .064

INT3         -.1110      -.0486      -.0593       .0489       .0807      -.0694
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .000     P= .071     P= .037     P= .071     P= .007     P= .018

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              SID14       SID15       SID16       SID17       AGST1       AGST2

INT4         -.0389       .0303       .0312       .0206       .0372      -.0400
            (  910)     (  910)     (  910)     (  910)     (  910)     (  910)
            P= .120     P= .181     P= .173     P= .267     P= .131     P= .114

PASTINT1     -.0208       .0201       .0824      -.0819       .0413      -.0358
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .265     P= .273     P= .006     P= .007     P= .107     P= .140

PASTINT2     -.0668       .0332      -.0312       .0407       .0460      -.0488
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .022     P= .159     P= .174     P= .110     P= .083     P= .071

PASTINT3     -.0635      -.0846      -.0836       .0675       .0587      -.0478
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .028     P= .005     P= .006     P= .021     P= .038     P= .075

PASTINT4     -.0117       .0138       .0501      -.0013       .0419      -.0485
            (  907)     (  907)     (  907)     (  907)     (  907)     (  907)
            P= .362     P= .339     P= .066     P= .485     P= .104     P= .072

MARABG        .0112      -.0520       .2720      -.0967       .1297      -.1333
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .368     P= .058     P= .000     P= .002     P= .000     P= .000

MARABL       -.1006      -.0625       .2124      -.0608       .1162      -.1077
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .001     P= .030     P= .000     P= .033     P= .000     P= .001

MCAST        -.1102      -.0665       .0052       .0555       .0940      -.0858
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .000     P= .022     P= .438     P= .047     P= .002     P= .005

MABAT         .1438       .0524       .0334      -.0617       .1433      -.1197
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .000     P= .057     P= .157     P= .031     P= .000     P= .000

MATHM         .0619       .0381       .3037       .0662       .1453      -.1288
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .031     P= .125     P= .000     P= .023     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

             SID14       SID15       SID16       SID17       AGST1       AGST2

MATADQ        .0910       .2977     -.0455       .3651      -.0053       .0055
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .003     P= .000     P= .086     P= .000     P= .437     P= .434

TEAOPN1      -.1129       .0040       .0675       .0272      -.0287       .0334
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .453     P= .021     P= .207     P= .194     P= .158

TEAOPN2      -.0521       .2353     -.0831       .2886      -.0322       .0346
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .059     P= .000     P= .006     P= .000     P= .167     P= .149

TEAOPN3      -.0924       .2115       .0328       .2594      -.0508       .0488
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .003     P= .000     P= .162     P= .000     P= .063     P= .071

TEAOPN4       .2267       .2163     -.0701       .1283      -.0271       .0300
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .018     P= .000     P= .208     P= .184

TEAOPN5       .1354       .2111     -.0236      -.0300      -.0282       .0324
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .239     P= .184     P= .199     P= .166

TEAOPN6       .0675       .1449     -.2420      -.1230      -.0737       .0630
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .021     P= .000     P= .000     P= .000     P= .013     P= .029

MSCACL        .0405      -.0774       .2120      -.3177       .0432      -.0505
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .112     P= .010     P= .000     P= .000     P= .098     P= .065

NATT         -.0631       .1068       .0542       .1310       .0328      -.0337
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .029     P= .001     P= .052     P= .000     P= .162     P= .156

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              SID14       SID15       SID16       SID17       AGST1       AGST2

ENROLL        .1068      -.1880      -.0954       .0083       .0519      -.0512
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .001     P= .000     P= .002     P= .401     P= .060     P= .062

CLASNO        .1579      -.3025      -.2027       .1976       .0549      -.0541
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .000     P= .050     P= .052

SCLASS        .1035      -.4136       .3537      -.0696       .0853      -.0864
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .001     P= .000     P= .000     P= .018     P= .005     P= .005

SCIST         .0086      -.2728       .4299      -.1982       .0804      -.0805
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .398     P= .000     P= .000     P= .000     P= .008     P= .008

NEWST         .2251      -.0806       .1267       .1774       .0535      -.0475
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .008     P= .000     P= .000     P= .054     P= .077

GRADST        .2452      -.4236       .3834       .1907       .0712      -.0713
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .000     P= .016     P= .016

LOCAT1        .1828      -.2806       .2145       .1347      -.0116       .0108
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .000     P= .364     P= .372

LOCAT2       -.1458       .3519      -.1711      -.1074       .0244      -.0262
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .001     P= .232     P= .216

LOCAT3       -.0873      -.0525      -.1024      -.0643      -.0167       .0204
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .004     P= .058     P= .001     P= .027     P= .309     P= .270

ESTBDATE      .1805       .1583      -.0799       .1330      -.0404       .0360
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .008     P= .000     P= .113     P= .140

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              SID14      SID15      SID16      SID17      AGST1      AGST2

BUILD1        -.4021      .1276     -.4719     -.2963     -.0032      .0009
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .000    P= .000    P= .461    P= .490

BUILD2         .4021     -.1276      .4719      .2963      .0032     -.0009
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .000    P= .000    P= .461    P= .490

STTOTRAT      -.1132      .0095     -.4358      .1385     -.0408      .0441
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .387    P= .000    P= .000    P= .110    P= .093


              FD1        FD2        FD3        FD4        FD5        FD6

NATST         -.1739     -.0114     -.0356     -.1887     -.0525      .1378
             (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
             P= .000    P= .366    P= .142    P= .000    P= .057    P= .000

BN            -.1522      .0267     -.0851      .0324     -.0371      .1029
             (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
             P= .000    P= .210    P= .005    P= .164    P= .132    P= .001

BROTHED       -.0446     -.0380      .0132      .0154      .0826     -.0223
             (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
             P= .089    P= .126    P= .346    P= .322    P= .006    P= .250

TEACSCI       -.0501     -.0705      .0518     -.0410     -.0547      .0844
             (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
             P= .066    P= .017    P= .059    P= .108    P= .049    P= .005

YEARNO         .0483      .0003      .0068      .0295     -.0052      .0056
             (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
             P= .072    P= .496    P= .419    P= .187    P= .438    P= .433

INT1           .0108     -.0367     -.0523     -.0050     -.0189     -.0376
             (  909)    (  909)    (  909)    (  909)    (  909)    (  909)
             P= .373    P= .135    P= .058    P= .440    P= .285    P= .129

INT2           .0247     -.0191     -.1072     -.0264      .0300      .0346
             (  908)    (  908)    (  908)    (  908)    (  908)    (  908)
             P= .229    P= .283    P= .001    P= .213    P= .184    P= .149

INT3          -.0225      .0144     -.0304     -.0261     -.0174      .0350
             (  909)    (  909)    (  909)    (  909)    (  909)    (  909)
             P= .249    P= .332    P= .180    P= .216    P= .300    P= .146

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              FD1         FD2         FD3         FD4         FD5         FD6

INT4          .0148       .0131       .0001      -.0507      -.0548       .0658
            (  910)     (  910)     (  910)     (  910)     (  910)     (  910)
            P= .328     P= .347     P= .498     P= .063     P= .049     P= .024

PASTINT1     -.0340      -.0183       .0208      -.0171       .0137       .0127
            (  911)     (  911)     (  911)     (  911)     (  911)     (  911)
            P= .152     P= .291     P= .265     P= .303     P= .340     P= .351

PASTINT2      .0124      -.0027      -.0345      -.0642       .0178       .0711
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .355     P= .468     P= .149     P= .027     P= .296     P= .016

PASTINT3     -.0804       .0356       .0214      -.0028      -.0121       .0197
            (  909)     (  909)     (  909)     (  909)     (  909)     (  909)
            P= .008     P= .142     P= .259     P= .466     P= .358     P= .277

PASTINT4     -.0196       .0080       .0182      -.0551       .0122       .0535
            (  907)     (  907)     (  907)     (  907)     (  907)     (  907)
            P= .278     P= .405     P= .292     P= .049     P= .356     P= .054

MARABG       -.0298       .0213      -.0190       .0044      -.0415       .0213
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .185     P= .260     P= .283     P= .447     P= .105     P= .261

MARABL       -.0347      -.0003      -.0093      -.0275      -.0106      -.0010
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .147     P= .496     P= .390     P= .204     P= .374     P= .488

MCAST        -.0182       .0088       .0990      -.0057      -.0002       .0244
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .291     P= .396     P= .001     P= .431     P= .498     P= .231

MABAT        -.0178      -.0185      -.0127       .0010      -.0365       .0088
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .296     P= .289     P= .351     P= .487     P= .135     P= .395

MATHM         .0181      -.0121      -.0225      -.0231      -.0973      -.0049
            (  912)     (  912)     (  912)     (  912)     (  912)     (  912)
            P= .293     P= .358     P= .249     P= .243     P= .002     P= .441

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

                FD1         FD2         FD3         FD4         FD5         FD6

MATADQ        -.0443       .0745       .0367       .0267      -.0282      -.0244
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .092     P= .013     P= .136     P= .211     P= .199     P= .232

TEAOPN1       -.0049      -.0327      -.0392       .0892      -.0437       .0146
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .442     P= .163     P= .120     P= .004     P= .095     P= .331

TEAOPN2       -.0787      -.0312      -.0152       .0803      -.0189       .0129
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .009     P= .174     P= .324     P= .008     P= .285     P= .350

TEAOPN3        .0033      -.0596       .0139      -.0100       .0797      -.0099
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .460     P= .037     P= .338     P= .382     P= .008     P= .383

TEAOPN4       -.0399       .0116       .0076       .0384       .0187       .0847
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .116     P= .364     P= .409     P= .125     P= .288     P= .005

TEAOPN5        .0181      -.0050      -.0793       .0379       .0331      -.0204
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .293     P= .441     P= .009     P= .127     P= .160     P= .270

TEAOPN6        .0536       .0099      -.0176      -.0108       .0308      -.0075
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .054     P= .383     P= .298     P= .373     P= .178     P= .411

MSCACL         .0881      -.0401      -.0252      -.0126      -.0308      -.0162
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .004     P= .114     P= .225     P= .352     P= .177     P= .313

NATT          -.0910       .0010       .0686      -.0310       .0539      -.0437
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .003     P= .488     P= .020     P= .176     P= .053     P= .095

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             FD1         FD2         FD3         FD4         FD5         FD6

ENROLL      -.0406      -.0353       .0068      -.0292      -.0083       .0217
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .111     P= .144     P= .420     P= .190     P= .402     P= .257

CLASNO      -.0130      -.0159      -.0055      -.0382      -.0033       .0276
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .348     P= .316     P= .434     P= .126     P= .460     P= .204

SCLASS       .0462      -.0343      -.0019      -.0619      -.0193       .0101
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .083     P= .152     P= .478     P= .031     P= .281     P= .381

SCIST        .0193      -.0463      -.0059      -.0533      -.0066       .0061
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .281     P= .082     P= .430     P= .055     P= .422     P= .427

NEWST       -.0803      -.0357       .0253      -.0145      -.0063       .0123
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .008     P= .142     P= .224     P= .331     P= .425     P= .355

GRADST      -.0129      -.0186       .0246      -.0427      -.0018       .0059
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .349     P= .289     P= .230     P= .100     P= .478     P= .429

LOCAT1      -.0987      -.0202       .0530      -.0059       .0345      -.0175
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .001     P= .272     P= .056     P= .430     P= .150     P= .300

LOCAT2       .1064      -.0143      -.0680       .0352      -.0350      -.0058
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .001     P= .334     P= .021     P= .145     P= .147     P= .431

LOCAT3       .0068       .0541       .0121      -.0416      -.0056       .0371
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .419     P= .052     P= .358     P= .106     P= .433     P= .132

ESTBDATE     .0275       .0251      -.0182       .0093      -.0817       .0293
           (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
           P= .205     P= .226     P= .292     P= .390     P= .007     P= .190

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              FD1         FD2         FD3         FD4         FD5         FD6

BUILD1      -.0159      -.0342       .0077      -.0178       .0493       .0044
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .316     P= .152     P= .409     P= .297     P= .069     P= .448

BUILD2       .0159       .0342      -.0077       .0178      -.0493      -.0044
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .316     P= .152     P= .409     P= .297     P= .069     P= .448

STTOTRAT     .0417       .0496      -.0194       .0062       .0309       .0239
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .105     P= .068     P= .280     P= .426     P= .176     P= .237


              FD          FAOC1       FAOC3       FAOC4       FAOC5       FAOC6

NATST        .3515       .0583      -.1529       .0010      -.1166       .3237
            ( 906)      ( 912)      ( 912)      ( 912)      ( 912)      ( 912)
            P= .000     P= .039     P= .000     P= .488     P= .000     P= .000

BN           .2037      -.0385      -.1370       .0341       .0949       .1476
            ( 905)      ( 911)      ( 911)      ( 911)      ( 911)      ( 911)
            P= .000     P= .123     P= .000     P= .152     P= .002     P= .000

BROTHED      .0344       .0312       .0315      -.0044       .0206      -.0098
            ( 905)      ( 911)      ( 911)      ( 911)      ( 911)      ( 911)
            P= .151     P= .174     P= .171     P= .447     P= .267     P= .384

TEACSCI      .0787       .0140      -.0929      -.0406       .0000       .0219
            ( 905)      ( 911)      ( 911)      ( 911)      ( 911)      ( 911)
            P= .009     P= .337     P= .003     P= .110     P= .500     P= .254

YEARNO      -.0699       .0426       .0300      -.0472      -.0082      -.1013
            ( 905)      ( 911)      ( 911)      ( 911)      ( 911)      ( 911)
            P= .018     P= .100     P= .183     P= .077     P= .403     P= .001

INT1         .0391       .0169      -.0099       .0365      -.0606       .0279
            ( 903)      ( 909)      ( 909)      ( 909)      ( 909)      ( 909)
            P= .120     P= .305     P= .383     P= .136     P= .034     P= .201

INT2         .0865       .0119      -.0263       .0112      -.0360       .0380
            ( 902)      ( 908)      ( 908)      ( 908)      ( 908)      ( 908)
            P= .005     P= .360     P= .214     P= .368     P= .139     P= .126

INT3         .0563       .0051      -.0077      -.0152      -.1117       .0704
            ( 903)      ( 909)      ( 909)      ( 909)      ( 909)      ( 909)
            P= .046     P= .439     P= .408     P= .324     P= .000     P= .017

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

                 FD          FAOC1        FAOC3        FAOC4        FAOC5        FAOC6

INT4           .0061       -.0131        .0001        .0065       -.0643       -.0042
             (  904)      (  910)      (  910)      (  910)      (  910)      (  910)
             P= .428      P= .347      P= .499      P= .423      P= .026      P= .449

PASTINT1       .0671       -.0271       -.0414        .0676       -.0126        .0527
             (  905)      (  911)      (  911)      (  911)      (  911)      (  911)
             P= .022      P= .207      P= .106      P= .021      P= .352      P= .056

PASTINT2       .0476        .0049        .0006        .0308       -.0361        .0378
             (  903)      (  909)      (  909)      (  909)      (  909)      (  909)
             P= .077      P= .441      P= .493      P= .177      P= .139      P= .127

PASTINT3       .0652       -.0041       -.0397        .0476       -.0432        .0372
             (  903)      (  909)      (  909)      (  909)      (  909)      (  909)
             P= .025      P= .451      P= .116      P= .076      P= .096      P= .131

PASTINT4       .0190       -.0089       -.0510       -.0353       -.0111        .0493
             (  901)      (  907)      (  907)      (  907)      (  907)      (  907)
             P= .284      P= .394      P= .063      P= .144      P= .369      P= .069

MARABG         .0742       -.0172        .0031       -.0165       -.0157        .1045
             (  906)      (  912)      (  912)      (  912)      (  912)      (  912)
             P= .013      P= .302      P= .463      P= .309      P= .318      P= .001

MARABL         .0914       -.0285       -.0205       -.0645       -.0217        .1160
             (  906)      (  912)      (  912)      (  912)      (  912)      (  912)
             P= .003      P= .195      P= .268      P= .026      P= .256      P= .000

MCAST         -.0528        .0620        .0038       -.0430       -.0408       -.0106
             (  906)      (  912)      (  912)      (  912)      (  912)      (  912)
             P= .056      P= .031      P= .455      P= .097      P= .109      P= .375

MABAT          .0725        .0074       -.0255        .0572       -.0292        .1202
             (  906)      (  912)      (  912)      (  912)      (  912)      (  912)
             P= .015      P= .411      P= .221      P= .042      P= .189      P= .000

MATHM          .0739        .0039       -.0011        .0503       -.0363        .0842
             (  906)      (  912)      (  912)      (  912)      (  912)      (  912)
             P= .013      P= .453      P= .486      P= .064      P= .136      P= .006

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

               FD        FAOC1       FAOC3       FAOC4       FAOC5       FAOC6

MATADQ       -.0174     -.0352       .0215       .0065       .0173       .0397
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .302    P= .146     P= .259     P= .422     P= .302     P= .117

TEAOPN1       .0253     -.0400      -.0490      -.0092       .0203       .0667
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .224    P= .115     P= .071     P= .392     P= .271     P= .023

TEAOPN2       .0861     -.0058      -.0246      -.0078       .0106       .0755
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .005    P= .430     P= .231     P= .407     P= .375     P= .012

TEAOPN3       .0148     -.0282      -.0594      -.0219       .0723       .0111
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .329    P= .199     P= .037     P= .256     P= .015     P= .370

TEAOPN4       .0135      .0210      -.0596       .0284       .0408       .0187
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .343    P= .264     P= .037     P= .197     P= .110     P= .287

TEAOPN5       .0156     -.0759      -.0045      -.0178       .0747       .0409
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .320    P= .011     P= .446     P= .296     P= .012     P= .110

TEAOPN6      -.0641     -.1038       .0384      -.0067       .0316       .0358
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .028    P= .001     P= .125     P= .421     P= .172     P= .141

MSCACL       -.0381     -.0638      -.0186       .0016       .0245       .0096
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .127    P= .028     P= .289     P= .481     P= .231     P= .386

NATT          .0665      .0406      -.0414      -.0543       .0296       .0260
            (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
            P= .023    P= .112     P= .107     P= .052     P= .187     P= .217

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

               FD        FAOC1      FAOC3      FAOC4      FAOC5      FAOC6

ENROLL        .0793      .1112     -.1176      .0108      .0178     -.0084
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .009    P= .000    P= .000    P= .373    P= .297    P= .400

CLASNO        .0466      .1376     -.1117      .0095     -.0045     -.0070
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .082    P= .000    P= .000    P= .387    P= .447    P= .417

SCLASS        .0156      .0864     -.0877      .0210     -.0208     -.0100
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .320    P= .005    P= .004    P= .264    P= .266    P= .382

SCIST         .0449      .0781     -.1044      .0115     -.0232     -.0152
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .090    P= .009    P= .001    P= .365    P= .243    P= .324

NEWST         .1153      .1081     -.0974      .0130      .0333     -.0062
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .001    P= .002    P= .349    P= .158    P= .427

GRADST        .0480      .1365     -.1271      .0239      .0091     -.0458
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .076    P= .000    P= .000    P= .237    P= .392    P= .085

LOCAT1        .0900      .1426     -.1268     -.0094      .0263     -.0671
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .004    P= .000    P= .000    P= .389    P= .215    P= .022

LOCAT2       -.0904     -.1034      .1277      .0358      .0048      .0252
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .003    P= .001    P= .000    P= .141    P= .443    P= .225

LOCAT3       -.0158     -.0831      .0218     -.0367     -.0501      .0733
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .318    P= .006    P= .256    P= .135    P= .066    P= .014

ESTBDATE     -.0058     -.0749      .0770      .0417     -.0028      .0738
            (  897)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .431    P= .012    P= .010    P= .106    P= .467    P= .013

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             FD        FAOC1       FAOC3       FAOC4       FAOC5       FAOC6

BUILD1      -.0028     -.0006      -.0638      -.0198      -.0113       .0066
           (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
           P= .467    P= .493     P= .028     P= .276     P= .368     P= .421

BUILD2       .0028      .0006       .0638       .0198       .0113      -.0066
           (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
           P= .467    P= .493     P= .028     P= .276     P= .368     P= .421

STTOTRAT    -.0908     -.0625       .0328       .0310      -.0235       .0276
           (  897)    (  903)     (  903)     (  903)     (  903)     (  903)
           P= .003    P= .030     P= .163     P= .176     P= .240     P= .204

            FAOC7      FAOC8       FAOC9        MD1         MD2         MD3

NATST       -.0744     -.1237       .0552      -.4017      -.0456       .0808
           (  912)    (  912)     (  912)     (  912)     (  912)     (  912)
           P= .012    P= .000     P= .048     P= .000     P= .084     P= .007

BN          -.0539      .0165      -.0268      -.1449      -.0248       .0659
           (  911)    (  911)     (  911)     (  911)     (  911)     (  911)
           P= .052    P= .310     P= .209     P= .000     P= .227     P= .023

BROTHED     -.0058      .0114      -.0742      -.0152      -.0050       .0242
           (  911)    (  911)     (  911)     (  911)     (  911)     (  911)
           P= .431    P= .366     P= .013     P= .324     P= .440     P= .233

TEACSCI     -.0017      .0330       .0600      -.1028       .0094       .0119
           (  911)    (  911)     (  911)     (  911)     (  911)     (  911)
           P= .479    P= .160     P= .035     P= .001     P= .389     P= .360

YEARNO       .1064      .0098      -.0408       .0588       .0212      -.0001
           (  911)    (  911)     (  911)     (  911)     (  911)     (  911)
           P= .001    P= .384     P= .109     P= .038     P= .262     P= .499

INT1        -.0126     -.0011      -.0002      -.0047      -.1200       .0077
           (  909)    (  909)     (  909)     (  909)     (  909)     (  909)
           P= .352    P= .486     P= .497     P= .444     P= .000     P= .409

INT2         .0322     -.0416       .0212      -.1126       .0161       .0094
           (  908)    (  908)     (  908)     (  908)     (  908)     (  908)
           P= .166    P= .105     P= .261     P= .000     P= .314     P= .388

INT3        -.0068     -.0356       .0740      -.0212      -.0625       .0042
           (  909)    (  909)     (  909)     (  909)     (  909)     (  909)
           P= .419    P= .142     P= .013     P= .261     P= .030     P= .449

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             FAOC7      FAOC8      FAOC9      MD1        MD2        MD3

INT4          .0127      .0180      .0356     -.0452     -.0211      .0442
           (  910)    (  910)    (  910)    (  910)    (  910)    (  910)
           P= .351    P= .293    P= .142    P= .087    P= .262    P= .091

PASTINT1     -.0153      .0126      .0040     -.0176     -.0341      .0380
           (  911)    (  911)    (  911)    (  911)    (  911)    (  911)
           P= .323    P= .352    P= .452    P= .298    P= .152    P= .126

PASTINT2     -.0270     -.0432      .0398     -.0529     -.0027     -.0005
           (  909)    (  909)    (  909)    (  909)    (  909)    (  909)
           P= .208    P= .096    P= .115    P= .055    P= .468    P= .494

PASTINT3     -.0088     -.0459      .0641     -.0548     -.0104      .0115
           (  909)    (  909)    (  909)    (  909)    (  909)    (  909)
           P= .396    P= .083    P= .027    P= .049    P= .377    P= .365

PASTINT4     -.0253      .0218      .0341      .0002     -.0132      .0146
           (  907)    (  907)    (  907)    (  907)    (  907)    (  907)
           P= .224    P= .256    P= .152    P= .497    P= .346    P= .330

MARABG       -.0233     -.0345     -.0052     -.0814      .0070      .0324
           (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
           P= .241    P= .149    P= .437    P= .007    P= .416    P= .164

MARABL       -.0219     -.0070      .0117     -.0565     -.0293      .0085
           (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
           P= .254    P= .417    P= .362    P= .044    P= .189    P= .399

MCAST        -.0027     -.0032      .0140      .0671     -.0530      .0509
           (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
           P= .467    P= .462    P= .336    P= .021    P= .055    P= .062

MABAT        -.0457     -.0392     -.0250     -.0848      .0043      .0342
           (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
           P= .084    P= .119    P= .225    P= .005    P= .449    P= .151

MATHM        -.0568     -.0751      .0446     -.0831     -.0202     -.0097
           (  912)    (  912)    (  912)    (  912)    (  912)    (  912)
           P= .043    P= .012    P= .089    P= .006    P= .272    P= .385

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

             FAOC7       FAOC8       FAOC9       MD1         MD2         MD3

MATADQ      -.0542      -.0008       .0154       .0549      -.0392      -.0139
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .052     P= .490     P= .322     P= .050     P= .120     P= .338

TEAOPN1     -.0105       .0580      -.0283      -.0189       .0386       .0616
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .376     P= .041     P= .197     P= .285     P= .123     P= .032

TEAOPN2      .0088       .0126      -.0700      -.0135      -.0048      -.0244
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .396     P= .353     P= .018     P= .343     P= .442     P= .232

TEAOPN3      .0202       .0090       .0184       .0152      -.0259       .0109
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .272     P= .393     P= .291     P= .324     P= .218     P= .372

TEAOPN4     -.0152       .0202      -.0114       .0100       .0704       .0353
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .324     P= .272     P= .366     P= .382     P= .017     P= .144

TEAOPN5     -.0052       .0398      -.0339      -.0241       .0625      -.0107
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .438     P= .116     P= .155     P= .234     P= .030     P= .374

TEAOPN6      .0448      -.0079      -.0028       .0804      -.0220      -.0097
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .089     P= .406     P= .466     P= .008     P= .254     P= .386

MSCACL       .0060       .0258       .0360      -.0187       .0048       .0464
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .428     P= .219     P= .140     P= .287     P= .443     P= .082

NATT        -.0117      -.0051      -.0176      -.0937      -.0016       .0326
            ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
            P= .363     P= .440     P= .298     P= .002     P= .481     P= .164

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              FAOC7       FAOC8       FAOC9       MD1         MD2         MD3

ENROLL        .0620      -.0464      -.0115      -.1153       .0567       .0202
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .031     P= .082     P= .365     P= .000     P= .044     P= .272

CLASNO        .0484      -.0490      -.0088      -.0839       .0475       .0308
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .073     P= .071     P= .395     P= .006     P= .077     P= .178

SCLASS        .0500      -.0491       .0285      -.0700       .0533       .0214
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .067     P= .070     P= .196     P= .018     P= .055     P= .260

SCIST         .0573      -.0368       .0345      -.1019       .0711       .0158
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .043     P= .134     P= .150     P= .001     P= .016     P= .317

NEWST         .0208      -.0424      -.0252      -.1353       .0762       .0035
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .267     P= .102     P= .225     P= .000     P= .011     P= .458

GRADST        .0351      -.0332       .0203      -.1078       .0821       .0339
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .146     P= .159     P= .271     P= .001     P= .007     P= .154

LOCAT1        .0410       .0006      -.0278      -.1571       .1094       .0233
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .109     P= .492     P= .202     P= .000     P= .000     P= .243

LOCAT2       -.0361      -.0289       .0085       .1289      -.0762      -.0636
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .139     P= .193     P= .400     P= .000     P= .011     P= .028

LOCAT3       -.0145       .0411       .0333       .0697      -.0684       .0545
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .331     P= .109     P= .159     P= .018     P= .020     P= .051

ESTBDATE     -.0455      -.0229       .0014       .0488      -.0811      -.0362
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .086     P= .246     P= .483     P= .071     P= .007     P= .139

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              FAOC7        FAOC8        FAOC9        MD1          MD2          MD3

BUILD1          .0446        .0183        .0107       -.0013       -.0286        .0219
             (  903)      (  903)      (  903)      (  903)      (  903)      (  903)
             P= .090      P= .291      P= .374      P= .485      P= .195      P= .256

BUILD2         -.0446       -.0183       -.0107        .0013        .0286       -.0219
             (  903)      (  903)      (  903)      (  903)      (  903)      (  903)
             P= .090      P= .291      P= .374      P= .485      P= .195      P= .256

STTOTRAT       -.0673        .0486        .0217        .1527       -.0737        .0035
             (  903)      (  903)      (  903)      (  903)      (  903)      (  903)
             P= .022      P= .072      P= .258      P= .000      P= .013      P= .458


              MD4          MD5          MD6          MD           RE1          RE2

NATST           .0385        .2550        .2779        .5229       -.0238        .0091
             (  912)      (  912)      (  912)      (  910)      (  912)      (  912)
             P= .123      P= .000      P= .000      P= .000      P= .237      P= .392

BN             -.0074        .0939        .1250        .1916        .0334       -.0287
             (  911)      (  911)      (  911)      (  909)      (  911)      (  911)
             P= .412      P= .002      P= .000      P= .000      P= .157      P= .194

BROTHED         .0334       -.0086       -.0192        .0118       -.0054        .0150
             (  911)      (  911)      (  911)      (  909)      (  911)      (  911)
             P= .157      P= .398      P= .281      P= .362      P= .435      P= .326

TEACSCI         .0594        .0176        .0961        .1024       -.0593        .0335
             (  911)      (  911)      (  911)      (  909)      (  911)      (  911)
             P= .037      P= .298      P= .002      P= .001      P= .037      P= .156

YEARNO         -.0276       -.0241       -.0163       -.0821        .0664       -.0126
             (  911)      (  911)      (  911)      (  909)      (  911)      (  911)
             P= .202      P= .234      P= .312      P= .007      P= .023      P= .352

INT1            .0351        .0686       -.0008        .0507        .0108       -.0227
             (  909)      (  909)      (  909)      (  907)      (  909)      (  909)
             P= .145      P= .019      P= .491      P= .064      P= .372      P= .247

INT2           -.0042        .0814        .0658        .1486       -.0893        .0805
             (  908)      (  908)      (  908)      (  906)      (  908)      (  908)
             P= .450      P= .007      P= .024      P= .000      P= .004      P= .008

INT3            .0287        .0766        .0192        .0648       -.0621        .0348
             (  909)      (  909)      (  909)      (  907)      (  909)      (  909)
             P= .194      P= .010      P= .282      P= .026      P= .031      P= .147

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
---- PEARSON CORRELATION COEFFICIENTS -

              MD4         MD5         MD6         MD          RE1         RE2

INT4            .0392       .0355       .0213       .0386      -.0490      -.0519
              (  910)     (  910)     (  910)     (  908)     (  910)     (  910)
              P= .119     P= .142     P= .260     P= .123     P= .070     P= .059

PASTINT1       -.0079       .0524       .0349       .0235      -.0274       .0148
              (  911)     (  911)     (  911)     (  909)     (  911)     (  911)
              P= .406     P= .057     P= .146     P= .240     P= .205     P= .327

PASTINT2        .0075       .0796      -.0295       .0737      -.0981       .0457
              (  909)     (  909)     (  909)     (  907)     (  909)     (  909)
              P= .411     P= .008     P= .187     P= .013     P= .002     P= .084

PASTINT3        .0039       .0763       .0388       .0730      -.0828       .0329
              (  909)     (  909)     (  909)     (  907)     (  909)     (  909)
              P= .453     P= .011     P= .121     P= .014     P= .006     P= .161

PASTINT4        .0106       .0252       .0130      -.0115      -.0655      -.0291
              (  907)     (  907)     (  907)     (  905)     (  907)     (  907)
              P= .375     P= .224     P= .348     P= .365     P= .024     P= .191

MARABG         -.0355       .0514       .0893       .0987      -.0231       .0451
              (  912)     (  912)     (  912)     (  910)     (  912)     (  912)
              P= .142     P= .060     P= .003     P= .001     P= .243     P= .087

MARABL         -.0505       .0633       .0874       .1072      -.0934       .0455
              (  912)     (  912)     (  912)     (  910)     (  912)     (  912)
              P= .064     P= .028     P= .004     P= .001     P= .002     P= .085

MCAST           .0040      -.0404      -.0232      -.0816      -.0352      -.0896
              (  912)     (  912)     (  912)     (  910)     (  912)     (  912)
              P= .452     P= .111     P= .242     P= .007     P= .144     P= .003

MABAT          -.0112       .0802       .0462       .1126      -.0415       .0816
              (  912)     (  912)     (  912)     (  910)     (  912)     (  912)
              P= .367     P= .008     P= .082     P= .000     P= .105     P= .007

MATHM          -.0308       .1022       .0924       .1494      -.0983       .0402
              (  912)     (  912)     (  912)     (  910)     (  912)     (  912)
              P= .177     P= .001     P= .003     P= .000     P= .001     P= .113

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

               MD4          MD5          MD6          MD          RE1          RE2


MATADQ        -.0362       -.0213       -.0325       -.0329       -.0198        .0051
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .138      P= .261      P= .164      P= .162      P= .277      P= .439

TEAOPN1       -.0352       -.0236       -.0167        .0100       -.0508        .0282
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .145      P= .239      P= .308      P= .383      P= .064      P= .199

TEAOPN2       -.0070        .0725       -.0368        .0395        .0056       -.0099
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .417      P= .015      P= .134      P= .118      P= .434      P= .383

TEAOPN3        .0171        .0292       -.0821       -.0099       -.0674        .0146
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .304      P= .191      P= .007      P= .383      P= .021      P= .331

TEAOPN4       -.0217        .0065       -.0813       -.0582       -.0167       -.0375
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .258      P= .423      P= .007      P= .041      P= .308      P= .130

TEAOPN5       -.0305        .0734       -.0445       -.0048        .0304       -.0196
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .180      P= .014      P= .091      P= .443      P= .180      P= .278

TEAOPN6       -.0126       -.0037       -.0989       -.0910       -.0011       -.0397
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .353      P= .455      P= .001      P= .003      P= .486      P= .117

MSCACL         .0222       -.0240       -.0056        .0076       -.0133       -.0130
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .252      P= .236      P= .433      P= .410      P= .345      P= .348

NATT           .0436        .0401        .0126        .0966        .0000        .0613
             (  903)      (  903)      (  903)      (  901)      (  903)      (  903)
             P= .095      P= .114      P= .353      P= .002      P= .500      P= .033

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

               MD4        MD5        MD6        MD         RE1        RE2

ENROLL         .0172      .0317      .0751      .1080      .0440     -.0345
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .303    P= .171    P= .012    P= .001    P= .093    P= .150

CLASNO         .0061      .0084      .0591      .0716      .0380     -.0569
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .427    P= .400    P= .038    P= .016    P= .127    P= .044

SCLASS        -.0055     -.0291      .0959      .0555      .0316     -.1128
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .435    P= .191    P= .002    P= .048    P= .172    P= .000

SCIST          .0005     -.0113      .1097      .0885      .0498     -.0895
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .493    P= .367    P= .000    P= .004    P= .067    P= .004

NEWST          .0301      .0191      .0815      .1260      .0255      .0100
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .183    P= .283    P= .007    P= .000    P= .222    P= .382

GRADST        -.0107      .0000      .0899      .0844      .0414     -.1020
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .374    P= .500    P= .003    P= .006    P= .107    P= .001

LOCAT1         .0131      .0581      .0672      .1303      .0423      .0250
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .348    P= .041    P= .022    P= .000    P= .102    P= .226

LOCAT2        -.0392     -.0280     -.0332     -.0917     -.0192     -.0195
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .120    P= .200    P= .159    P= .003    P= .282    P= .279

LOCAT3         .0356     -.0544     -.0618     -.0799     -.0414     -.0127
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .142    P= .051    P= .032    P= .008    P= .107    P= .352

ESTBDATE      -.0014      .0431     -.0197      .0043     -.0395     -.0340
            (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
            P= .483    P= .098    P= .278    P= .449    P= .118    P= .154

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

               MD4        MD5        MD6        MD         RE1        RE2

BUILD1          .0161      .0399     -.0143      .0054      .0092      .0371
              (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
              P= .314    P= .116    P= .334    P= .436    P= .391    P= .133

BUILD2         -.0161     -.0399      .0143     -.0054     -.0092     -.0371
              (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
              P= .314    P= .116    P= .334    P= .436    P= .391    P= .133

STTOTRAT       -.0488     -.0234     -.0965     -.1472     -.0529      .0347
              (  903)    (  903)    (  903)    (  901)    (  903)    (  903)
              P= .071    P= .241    P= .002    P= .000    P= .056    P= .149


               RE3        RE4        RE5        RE6        NATST      BN

NATST           .0024     -.0686      .0466      .0689     1.0000      .1639
              (  912)    (  912)    (  912)    (  912)    (    0)    (  911)
              P= .471    P= .019    P= .080    P= .019    P= .       P= .000

BN              .0127      .0413     -.0688      .0058      .1639     1.0000
              (  911)    (  911)    (  911)    (  911)    (  911)    (    0)
              P= .351    P= .107    P= .019    P= .430    P= .000    P= .

BROTHED        -.0055     -.0175      .0422     -.0207     -.0581     -.3676
              (  911)    (  911)    (  911)    (  911)    (  911)    (  910)
              P= .435    P= .299    P= .101    P= .266    P= .040    P= .000

TEACSCI         .0107     -.0248      .0451     -.0126      .1112      .0883
              (  911)    (  911)    (  911)    (  911)    (  911)    (  910)
              P= .374    P= .228    P= .087    P= .352    P= .000    P= .004

YEARNO          .0548      .0245      .0570     -.1223     -.0634     -.0040
              (  911)    (  911)    (  911)    (  911)    (  911)    (  910)
              P= .049    P= .230    P= .043    P= .000    P= .028    P= .452

INT1           -.1175      .0349      .0082      .0341      .0494      .0291
              (  909)    (  909)    (  909)    (  909)    (  909)    (  908)
              P= .000    P= .147    P= .403    P= .153    P= .068    P= .191

INT2           -.0873     -.0538     -.0253      .0659      .0819      .0688
              (  908)    (  908)    (  908)    (  908)    (  908)    (  907)
              P= .004    P= .053    P= .223    P= .024    P= .007    P= .019

INT3            .0105     -.0604     -.0059      .0650      .0600      .0278
              (  909)    (  909)    (  909)    (  909)    (  909)    (  908)
              P= .375    P= .034    P= .430    P= .025    P= .035    P= .201

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

              RE3         RE4         RE5         RE6        NATST        BN

INT4        -.0808       .0561       .0486       .0398       .0284       .0452
           (  910)     (  910)     (  910)     (  910)     (  910)     (  909)
           P= .007     P= .045     P= .072     P= .115     P= .196     P= .086

PASTINT1    -.1250       .0079       .0031       .0451      -.0058       .0320
           (  911)     (  911)     (  911)     (  911)     (  911)     (  910)
           P= .000     P= .406     P= .463     P= .087     P= .431     P= .168

PASTINT2    -.0998      -.0388       .0095       .0886       .0500       .0301
           (  909)     (  909)     (  909)     (  909)     (  909)     (  908)
           P= .001     P= .121     P= .388     P= .004     P= .066     P= .183

PASTINT3    -.0138      -.0771       .0630       .0726       .0574       .0615
           (  909)     (  909)     (  909)     (  909)     (  909)     (  908)
           P= .339     P= .010     P= .029     P= .014     P= .042     P= .032

PASTINT4    -.0514       .0310       .0285       .0484       .0302       .0464
           (  907)     (  907)     (  907)     (  907)     (  907)     (  906)
           P= .061     P= .176     P= .195     P= .072     P= .182     P= .082

MARABG      -.0309      -.0489      -.0131       .0363       .0941       .0366
           (  912)     (  912)     (  912)     (  912)     (  912)     (  911)
           P= .176     P= .070     P= .347     P= .137     P= .002     P= .135

MARABL      -.0146      -.0062      -.0552       .0354       .1022       .0267
           (  912)     (  912)     (  912)     (  912)     (  912)     (  911)
           P= .330     P= .426     P= .048     P= .143     P= .001     P= .210

MCAST        .0875       .0584       .0273       .0187      -.0922      -.0436
           (  912)     (  912)     (  912)     (  912)     (  912)     (  911)
           P= .004     P= .039     P= .205     P= .286     P= .003     P= .095

MABAT       -.0637      -.0672      -.0736       .0772       .0949       .0612
           (  912)     (  912)     (  912)     (  912)     (  912)     (  911)
           P= .027     P= .021     P= .013     P= .010     P= .002     P= .032

MATHM       -.0397      -.0138      -.0393       .0612       .1589       .0630
           (  912)     (  912)     (  912)     (  912)     (  912)     (  911)
           P= .116     P= .339     P= .118     P= .032     P= .000     P= .029

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              RE3        RE4        RE5        RE6        NATST      BN

MATADQ        .0347      .0383      .0051     -.0710      .0439      .0045
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .149    P= .125    P= .439    P= .016    P= .094    P= .446

TEAOPN1      -.0299     -.0095      .0477     -.0156     -.0160      .0302
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .185    P= .388    P= .076    P= .320    P= .315    P= .182

TEAOPN2      -.0106      .0185      .0419     -.0361      .0556      .0673
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .375    P= .289    P= .104    P= .139    P= .047    P= .022

TEAOPN3      -.0281      .0240     -.0035     -.0025     -.0113      .0425
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .200    P= .236    P= .458    P= .471    P= .367    P= .101

TEAOPN4      -.0559      .0176      .0534      .0430     -.0176      .0373
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .047    P= .299    P= .054    P= .098    P= .299    P= .132

TEAOPN5      -.0596     -.0410      .0611      .0627      .0022      .0185
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .037    P= .109    P= .033    P= .030    P= .473    P= .289

TEAOPN6       .0011     -.0078      .0271      .0609     -.1468      .0022
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .486    P= .408    P= .208    P= .034    P= .000    P= .473

MSCACL       -.0820      .0037     -.0152      .0765     -.0778     -.0155
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .007    P= .456    P= .324    P= .011    P= .010    P= .321

NATT         -.0294     -.0365      .0249     -.0396      .1120      .0590
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .188    P= .136    P= .227    P= .117    P= .000    P= .038

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

               RE3        RE4        RE5        RE6        NATST      BN

ENROLL       -.0330     -.0453      .0157      .1009      .1594      .0958
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .161    P= .087    P= .319    P= .001    P= .000    P= .002

CLASNO       -.0318     -.0061      .0196      .0816      .1311      .0639
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .170    P= .427    P= .278    P= .007    P= .000    P= .027

SCLASS        .0116      .0346      .0124      .0915      .0442      .0246
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .364    P= .149    P= .355    P= .003    P= .092    P= .230

SCIST        -.0037      .0079      .0146      .0875      .0778      .0422
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .455    P= .406    P= .330    P= .004    P= .010    P= .103

NEWST        -.0272     -.0643      .0433      .0456      .1971      .0823
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .207    P= .027    P= .097    P= .085    P= .000    P= .007

GRADST       -.0066      .0138      .0501      .0826      .1552      .0456
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .422    P= .339    P= .066    P= .007    P= .000    P= .085

LOCAT1       -.0543     -.0636      .0536      .0167      .2117      .0832
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .051    P= .028    P= .054    P= .308    P= .000    P= .006

LOCAT2        .0467      .0328     -.0556      .0094     -.1560     -.0676
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .080    P= .163    P= .048    P= .389    P= .000    P= .021

LOCAT3        .0210      .0565     -.0070     -.0411     -.1198     -.0380
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .264    P= .045    P= .417    P= .109    P= .000    P= .127

ESTBDATE      .0341      .0477     -.0176      .0043     -.0120      .0080
            (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
            P= .153    P= .076    P= .298    P= .448    P= .359    P= .405

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

             RE3        RE4        RE5        RE6       NATST        BN

BUILD1     -.0281     -.0552     -.0317      .0560     -.0201      .0419
          (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
          P= .200    P= .049    P= .171    P= .046    P= .273    P= .105

BUILD2      .0281      .0552      .0317     -.0560      .0201     -.0419
          (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
          P= .200    P= .049    P= .171    P= .046    P= .273    P= .105

STTOTRAT    .0630      .0446     -.0445     -.0861     -.1493     -.0638
          (  903)    (  903)    (  903)    (  903)    (  903)    (  902)
          P= .029    P= .090    P= .091    P= .005    P= .000    P= .028

           BROTHED    TEACSCI    YEARNO      INT1       INT2       INT3

NATST      -.0581      .1112     -.0634      .0494      .0819      .0600
          (  911)    (  911)    (  911)    (  909)    (  908)    (  909)
          P= .040    P= .000    P= .028    P= .068    P= .007    P= .035

BN         -.3676      .0883     -.0040      .0291      .0688      .0278
          (  910)    (  910)    (  910)    (  908)    (  907)    (  908)
          P= .000    P= .004    P= .452    P= .191    P= .019    P= .201

BROTHED    1.0000      .0167     -.0079     -.0168     -.0147     -.0011
          (    0)    (  910)    (  910)    (  908)    (  907)    (  908)
          P= .       P= .308    P= .406    P= .307    P= .329    P= .487

TEACSCI     .0167     1.0000     -.0337     -.1817     -.0416     -.0335
          (  910)    (    0)    (  910)    (  908)    (  907)    (  908)
          P= .308    P= .       P= .155    P= .000    P= .105    P= .157

YEARNO     -.0079     -.0337     1.0000     -.1256     -.1206     -.0915
          (  910)    (  910)    (    0)    (  908)    (  907)    (  908)
          P= .406    P= .155    P= .       P= .000    P= .000    P= .003

INT1       -.0168     -.1817     -.1256     1.0000      .3012      .1556
          (  908)    (  908)    (  908)    (    0)    (  908)    (  908)
          P= .307    P= .000    P= .000    P= .       P= .000    P= .000

INT2       -.0147     -.0416     -.1206      .3012     1.0000      .4461
          (  907)    (  907)    (  907)    (  908)    (    0)    (  908)
          P= .329    P= .105    P= .000    P= .000    P= .       P= .000

INT3       -.0011     -.0335     -.0915      .1556      .4461     1.0000
          (  908)    (  908)    (  908)    (  908)    (  908)    (    0)
          P= .487    P= .157    P= .003    P= .000    P= .000    P= .

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

              BROTHED     TEACSCI      YEARNO       INT1        INT2        INT3

INT4          -.0666      -.0687      -.0782       .3420       .2325       .1971
             (  909)     (  909)     (  909)     (  908)     (  908)     (  909)
             P= .022     P= .019     P= .009     P= .000     P= .000     P= .000

PASTINT1      -.0516      -.1669      -.1388       .5043       .2463       .0873
             (  910)     (  910)     (  910)     (  909)     (  908)     (  909)
             P= .060     P= .000     P= .000     P= .000     P= .000     P= .004

PASTINT2      -.0171      -.0568      -.1586       .2035       .5629       .3082
             (  908)     (  908)     (  908)     (  908)     (  908)     (  909)
             P= .304     P= .044     P= .000     P= .000     P= .000     P= .000

PASTINT3      -.0350      -.0885      -.1464       .1080       .3204       .5319
             (  908)     (  908)     (  908)     (  908)     (  908)     (  909)
             P= .146     P= .004     P= .000     P= .001     P= .000     P= .000

PASTINT4      -.1081      -.0830      -.0520       .2049       .1607       .0907
             (  906)     (  906)     (  906)     (  906)     (  906)     (  907)
             P= .001     P= .006     P= .059     P= .000     P= .000     P= .003

MARABG         .0428       .0299      -.1957       .0758       .2167       .1067
             (  911)     (  911)     (  911)     (  909)     (  908)     (  909)
             P= .098     P= .184     P= .000     P= .011     P= .000     P= .001

MARABL         .0208      -.0250      -.1503       .0927       .1909       .0598
             (  911)     (  911)     (  911)     (  909)     (  908)     (  909)
             P= .265     P= .226     P= .000     P= .003     P= .000     P= .036

MCAST          .0180       .0753      -.0394      -.0821      -.1072      -.0542
             (  911)     (  911)     (  911)     (  909)     (  908)     (  909)
             P= .293     P= .012     P= .117     P= .007     P= .001     P= .051

MABAT         -.0479      -.0674      -.1695       .2259       .1542       .0623
             (  911)     (  911)     (  911)     (  909)     (  908)     (  909)
             P= .074     P= .021     P= .000     P= .000     P= .000     P= .030

MATHM         -.0481      -.0050      -.2221       .0908       .1758       .0465
             (  911)     (  911)     (  911)     (  909)     (  908)     (  909)
             P= .074     P= .440     P= .000     P= .003     P= .000     P= .081

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             BROTHED     TEACSCI     YEARNO      INT1        INT2        INT3

AGET1         -.0011       .0143      .0644       .0513      -.0689       .0781
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .486     P= .334    P= .027     P= .062     P= .019     P= .010

AGET2          .0143      -.0396     -.0342      -.0722       .0019      -.0380
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .334     P= .117    P= .152     P= .015     P= .478     P= .128

AGET3         -.0176       .0371     -.0229       .0409       .0705      -.0326
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .298     P= .133    P= .246     P= .110     P= .017     P= .164

WHATEA1        .0671      -.0232      .0289       .0441      -.0307       .0081
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .022     P= .243    P= .193     P= .093     P= .179     P= .404

WHATEA2       -.0338       .0200     -.0182      -.0462       .0566       .0456
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .155     P= .274    P= .293     P= .083     P= .045     P= .086

WHATEA3       -.0440       .0072     -.0154      -.0057      -.0196      -.0535
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .093     P= .415    P= .322     P= .432     P= .278     P= .054

YEARTEA2      -.0005       .0090      .0128       .0575      -.0476       .0098
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .494     P= .394    P= .351     P= .042     P= .077     P= .385

YEARTEA3      -.0502       .0519      .0834       .0039       .0094      -.0446
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .066     P= .060    P= .006     P= .453     P= .389     P= .091

YEARTEA4       .0137      -.0266     -.0359      -.0695       .0107      -.0075
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .341     P= .212    P= .140     P= .019     P= .374     P= .411

DEGREE1        .0409       .0639      .0482      -.0286       .0336      -.0380
             (  902)     (  902)    (  902)     (  900)     (  899)     (  900)
             P= .110     P= .027    P= .074     P= .196     P= .157     P= .127

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

             BROTHED     TEACSCI     YEARNO      INT1        INT2        INT3

DEGREE2      -.0409      -.0639      -.0482       .0286      -.0336       .0380
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .110     P= .027     P= .074     P= .196     P= .157     P= .127

WHYTE1        .0164       .0090       .0387      -.0676      -.0246       .0275
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .312     P= .393     P= .123     P= .021     P= .231     P= .205

WHYTE2        .0074      -.0260      -.0269       .0559      -.0243       .0791
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .412     P= .217     P= .210     P= .047     P= .233     P= .009

WHYTE3       -.0183       .0235      -.0388       .0275       .0910       .0670
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .291     P= .240     P= .122     P= .205     P= .003     P= .022

WHYTE4       -.0379       .0356       .0113       .0307       .0242      -.0662
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .128     P= .143     P= .368     P= .179     P= .234     P= .023

WHYTE5        .0530      -.0550       .0089      -.0642      -.0705      -.0240
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .056     P= .049     P= .395     P= .027     P= .017     P= .236

DECTEA1      -.0532      -.0652      -.0196       .0278      -.0423      -.0909
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .055     P= .025     P= .278     P= .202     P= .103     P= .003

DECTEA2       .0325       .0171       .0071      -.0124       .0594       .0659
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .165     P= .304     P= .415     P= .355     P= .037     P= .024

DECTEA3       .0573       .0049      -.0474       .0332      -.0002       .0050
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .043     P= .441     P= .078     P= .160     P= .497     P= .441

DECTEA5      -.0273       .0128       .0167      -.0107      -.0459      -.0296
             ( 902)      ( 902)      ( 902)      ( 900)      ( 899)      ( 900)
             P= .207     P= .351     P= .308     P= .374     P= .085     P= .188

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              BROTHED     TEACSCI     YEARNO      INT1        INT2        INT3

STUNOCL2        .0481      -.0457       .0580       .0060       .0035       .0494
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .074     P= .085     P= .041     P= .429     P= .458     P= .069

STUNOCL3       -.0431      -.0113       .0301       .0072       .0380      -.0528
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .098     P= .367     P= .183     P= .415     P= .128     P= .057

STUNOCL4        .0391       .0165      -.0952       .0442      -.0219       .0450
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .121     P= .311     P= .002     P= .093     P= .256     P= .089

STUNOCL5       -.0213      -.0038       .0467      -.0470      -.0125      -.0216
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .262     P= .455     P= .081     P= .077     P= .354     P= .259

STUNOCL6       -.0219       .0296       .0378      -.0296       .0131      -.0200
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .255     P= .187     P= .128     P= .188     P= .347     P= .274

CLWEEK2        -.0068      -.0242      -.0571       .0700       .0694       .0068
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .419     P= .234     P= .043     P= .018     P= .019     P= .419

CLWEEK3         .0315       .0364      -.0275       .0281       .0256       .0768
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .172     P= .137     P= .205     P= .200     P= .222     P= .011

CLWEEK4        -.0289      -.0265       .0517      -.0579      -.0550      -.0803
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .193     P= .213     P= .060     P= .041     P= .050     P= .008

EQUAVA1         .0523      -.0146      -.0052       .0612       .0024       .0443
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .058     P= .331     P= .438     P= .033     P= .471     P= .092

EQUAVA2        -.0051       .0321       .0058       .0026      -.0401      -.0223
              (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
              P= .439     P= .168     P= .431     P= .469     P= .115     P= .252

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

            BROTHED    TEACSCI    YEARNO     INT1       INT2       INT3

EQUAVA3     -.0212     -.0263     -.0034     -.0338      .0409      .0009
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .262    P= .215    P= .459    P= .155    P= .110    P= .489

MATADQ      -.0410      .0227      .0114     -.0583      .0219     -.0482
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .109    P= .248    P= .367    P= .040    P= .256    P= .074

TEAOPN1     -.0583     -.0135      .0753      .0417     -.0219     -.0269
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .040    P= .343    P= .012    P= .106    P= .256    P= .210

TEAOPN2     -.0527      .0359      .0960      .0167      .0406     -.0262
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .057    P= .141    P= .002    P= .309    P= .112    P= .216

TEAOPN3     -.0328      .0067     -.0162      .0231      .0785     -.0195
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .163    P= .421    P= .313    P= .245    P= .009    P= .280

TEAOPN4     -.0581      .0211      .0692      .0285     -.0056     -.0904
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .041    P= .264    P= .019    P= .197    P= .434    P= .003

TEAOPN5     -.0433     -.0397     -.0277     -.0090     -.0074     -.0696
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .097    P= .117    P= .203    P= .394    P= .412    P= .018

TEAOPN6     -.0737     -.0367      .0227      .0163      .0444     -.0190
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .013    P= .136    P= .248    P= .313    P= .092    P= .285

MSCACL      -.0426     -.0486     -.0662      .0495      .0161      .0801
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .101    P= .073    P= .023    P= .069    P= .315    P= .008

NATT        -.0110      .0285      .0047     -.0783      .1019     -.0653
           (  902)    (  902)    (  902)    (  900)    (  899)    (  900)
           P= .370    P= .196    P= .444    P= .009    P= .001    P= .025

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  - -

              BROTHED     TEACSCI     YEARNO      INT1        INT2        INT3

ENROLL          .0366       .0609     -.0270      -.0390      -.0356       .0032
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .136     P= .034     P= .209     P= .121     P= .143     P= .462

CLASNO          .0339       .0467     -.0225      -.0591      -.0246       .0093
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .154     P= .081     P= .250     P= .038     P= .231     P= .390

SCLASS         -.0186       .0126     -.1223       .0197       .0358       .0166
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .288     P= .353     P= .000     P= .277     P= .142     P= .309

SCIST           .0006       .0134     -.1114       .0323       .0092      -.0150
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .493     P= .344     P= .000     P= .167     P= .391     P= .327

NEWST           .0043       .0626     -.0143      -.0572      -.0295      -.0522
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .449     P= .030     P= .334     P= .043     P= .189     P= .059

GRADST          .0004       .0371     -.1075      -.0495       .0371      -.0513
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .496     P= .133     P= .001     P= .069     P= .133     P= .062

LOCAT1          .0424       .0612     -.0086      -.0882       .0073      -.1276
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .102     P= .033     P= .399     P= .004     P= .413     P= .000

LOCAT2         -.0052      -.0312     -.0571       .0720      -.0469       .1166
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .438     P= .175     P= .043     P= .015     P= .080     P= .000

LOCAT3         -.0618      -.0549      .0971       .0396       .0562       .0391
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .032     P= .050     P= .002     P= .118     P= .046     P= .120

ESTBDATE       -.0682       .0072     -.0081       .0480      -.0087       .0441
             (  902)     (  902)     (  902)     (  900)     (  899)     (  900)
             P= .020     P= .414     P= .404     P= .075     P= .397     P= .093

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

                BROTHED      TEACSCI      YEARNO       INT1         INT2         INT3

BUILD1            .0621        .0404        .0225        .0318      -.0473        .0601
               (  902)      (  902)      (  902)      (  900)      (  899)      (  900)
               P= .031      P= .112      P= .250      P= .171      P= .078      P= .036

BUILD2           -.0621       -.0404       -.0225       -.0318        .0473       -.0601
               (  902)      (  902)      (  902)      (  900)      (  899)      (  900)
               P= .031      P= .112      P= .250      P= .171      P= .078      P= .036

STTOTRAT         -.0135       -.0239        .0793        .0392       -.0125        .0418
               (  902)      (  902)      (  902)      (  900)      (  899)      (  900)
               P= .342      P= .237      P= .009      P= .120      P= .355      P= .105


                INT4         PASTINT1     PASTINT2     PASTINT3     PASTINT4     MARABG

INT4             1.0000        .2538        .2279        .1927        .5246       -.0651
               (    0)      (  910)      (  909)      (  909)      (  907)      (  910)
               P= .         P= .000      P= .000      P= .000      P= .000      P= .025

PASTINT1          .2538       1.0000        .3777        .2455        .4009        .0698
               (  910)      (    0)      (  909)      (  909)      (  907)      (  911)
               P= .000      P= .         P= .000      P= .000      P= .000      P= .018

PASTINT2          .2279        .3777       1.0000        .4927        .2801        .1082
               (  909)      (  909)      (    0)      (  909)      (  907)      (  909)
               P= .000      P= .000      P= .         P= .000      P= .000      P= .001

PASTINT3          .1927        .2455        .4927       1.0000        .2625        .0843
               (  909)      (  909)      (  909)      (    0)      (  907)      (  909)
               P= .000      P= .000      P= .000      P= .         P= .000      P= .006

PASTINT4          .5246        .4009        .2801        .2625       1.0000        .0022
               (  907)      (  907)      (  907)      (  907)      (    0)      (  907)
               P= .000      P= .000      P= .000      P= .000      P= .         P= .474

MARABG           -.0651        .0698        .1082        .0843        .0022       1.0000
               (  910)      (  911)      (  909)      (  909)      (  907)      (    0)
               P= .025      P= .018      P= .001      P= .006      P= .474      P= .

MARABL            .0085        .0845        .0911        .0503        .0496        .6641
               (  910)      (  911)      (  909)      (  909)      (  907)      (  912)
               P= .399      P= .005      P= .003      P= .065      P= .068      P= .000

MCAST            -.0341       -.1331       -.1164       -.0895       -.0744        .0498
               (  910)      (  911)      (  909)      (  909)      (  907)      (  912)
               P= .152      P= .000      P= .000      P= .003      P= .013      P= .066

MABAT             .0376        .1836        .1280        .0633        .0576        .2449
               (  910)      (  911)      (  909)      (  909)      (  907)      (  912)
               P= .129      P= .000      P= .000      P= .028      P= .042      P= .000

MATHM             .0175        .1364        .1012        .0708        .0667        .3392
               (  910)      (  911)      (  909)      (  909)      (  907)      (  912)
               P= .299      P= .000      P= .001      P= .016      P= .022      P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

              INT4      PASTINT1   PASTINT2   PASTINT3   PASTINT4    MARABG

AGET1         -.0412     -.0001     -.0779     -.0261     -.0673     -.0422
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .108    P= .499    P= .010    P= .217    P= .022    P= .103

AGET2         -.0051     -.0447      .0370      .0375     -.0099     -.0807
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .440    P= .090    P= .134    P= .130    P= .384    P= .008

AGET3          .0504      .0590      .0336     -.0219      .0843      .1509
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .065    P= .038    P= .157    P= .256    P= .006    P= .000

WHATEA1        .0232      .0493      .0030      .0148      .0065      .0839
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .243    P= .070    P= .464    P= .329    P= .423    P= .006

WHATEA2        .0438     -.0094      .0847      .0507      .0353     -.0537
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .094    P= .389    P= .006    P= .064    P= .145    P= .053

WHATEA3       -.0690     -.0473     -.0856     -.0661     -.0417     -.0440
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .019    P= .078    P= .005    P= .024    P= .106    P= .093

YEARTEA2       .0754      .0221     -.0741     -.0658      .0048     -.1047
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .012    P= .253    P= .013    P= .024    P= .443    P= .001

YEARTEA3       .0192      .0089      .0029      .0037      .0073     -.0677
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .283    P= .394    P= .465    P= .456    P= .414    P= .021

YEARTEA4      -.0549     -.0341      .0530      .0452      .0077      .0595
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .050    P= .153    P= .056    P= .088    P= .409    P= .037

DEGREE1       -.0387     -.0441     -.0180     -.0096     -.0073     -.0823
             ( 901)     ( 902)     ( 900)     ( 900)     ( 898)     ( 903)
             P= .123    P= .093    P= .295    P= .387    P= .414    P= .007

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

               INT4      PASTINT1    PASTINT2    PASTINT3    PASTINT4     MARABG

DEGREE2        .0387       .0441       .0180       .0096       .0073       .0823
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .123     P= .093     P= .295     P= .387     P= .414     P= .007

WHYTE1       -.1000      -.0963      -.0103       .0331      -.0955       .0334
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .001     P= .002     P= .379     P= .161     P= .002     P= .158

WHYTE2         .0410       .0519       .0158       .0408       .0039       .0065
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .109     P= .060     P= .318     P= .111     P= .454     P= .423

WHYTE3         .0074       .0511       .0133       .0319      -.0006       .1321
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .412     P= .063     P= .345     P= .169     P= .493     P= .000

WHYTE4         .0619       .0271       .0162      -.0248       .0837      -.0721
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .032     P= .208     P= .314     P= .229     P= .006     P= .015

WHYTE5       -.0654      -.0571      -.0378      -.0344      -.0679      -.0165
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .025     P= .043     P= .129     P= .151     P= .021     P= .310

DECTEA1      -.0132       .0174      -.0408      -.0668       .0160       .0555
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .347     P= .301     P= .111     P= .023     P= .316     P= .048

DECTEA2      -.0237      -.0075       .0217       .0455      -.0414       .1024
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .239     P= .411     P= .258     P= .086     P= .108     P= .001

DECTEA3      -.0114       .0536       .0154      -.0362       .0539      -.0181
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .367     P= .054     P= .323     P= .139     P= .053     P= .294

DECTEA5        .0376      -.0172      -.0083      -.0060       .0222      -.1402
             (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
             P= .130     P= .303     P= .402     P= .429     P= .253     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              INT4     PASTINT1   PASTINT2   PASTINT3   PASTINT4    MARABG

STUNOCL2    -.0885     -.0009     -.0044      .0276     -.0456      .0984
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .004    P= .490    P= .448    P= .204    P= .086    P= .002

STUNOCL3    -.0158     -.0298     -.0200     -.0618      .0084      .1098
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .318    P= .186    P= .274    P= .032    P= .401    P= .000

STUNOCL4     .0668      .0707      .0174      .0748      .0372     -.0575
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .023    P= .017    P= .301    P= .012    P= .133    P= .042

STUNOCL5    -.0341     -.0289     -.0013     -.0484     -.0357     -.0546
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .153    P= .193    P= .484    P= .073    P= .143    P= .051

STUNOCL6     .0130     -.0682     -.0020     -.0009      .0101     -.0203
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .348    P= .020    P= .476    P= .489    P= .381    P= .271

CLWEEK2     -.0647      .0591     -.0081     -.0102     -.0341      .1584
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .026    P= .038    P= .404    P= .380    P= .154    P= .000

CLWEEK3      .0595      .0272      .0422      .1090      .0345      .0319
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .037    P= .207    P= .103    P= .001    P= .151    P= .169

CLWEEK4     -.0328     -.0523     -.0392     -.1057     -.0204     -.0988
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .162    P= .058    P= .120    P= .001    P= .271    P= .001

EQUAVA1      .0463      .0442      .0455      .0340      .0002      .0073
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .083    P= .092    P= .086    P= .154    P= .498    P= .413

EQUAVA2     -.0184     -.0108     -.0747     -.0551     -.0149     -.0396
           (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
           P= .290    P= .373    P= .013    P= .049    P= .327    P= .117

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              INT4      PASTINT1    PASTINT2    PASTINT3    PASTINT4     MARABG

EQUAVA3     -.0042      -.0111       .0553       .0406       .0156       .0379
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .450     P= .370     P= .049     P= .112     P= .320     P= .127

MATADQ      -.0505      -.0810      -.0293      -.0012      -.0352      -.0083
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .065     P= .008     P= .190     P= .486     P= .146     P= .402

TEAOPN1     -.0064       .0342      -.0213      -.0232      -.0114      -.0431
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .424     P= .152     P= .262     P= .244     P= .366     P= .098

TEAOPN2     -.0223      -.0082       .0142       .0054      -.0272      -.0304
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .252     P= .403     P= .335     P= .436     P= .208     P= .181

TEAOPN3     -.0224       .0030       .0224      -.0090      -.0112       .0418
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .251     P= .464     P= .251     P= .394     P= .368     P= .105

TEAOPN4      .0431       .0682       .0171      -.0361       .0606      -.1341
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .098     P= .020     P= .304     P= .140     P= .035     P= .000

TEAOPN5     -.0022      -.0076      -.0150      -.0341       .0198       .0226
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .473     P= .409     P= .327     P= .153     P= .277     P= .249

TEAOPN6      .0164       .0334       .0432       .0123       .0296      -.0184
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .311     P= .158     P= .098     P= .357     P= .188     P= .291

MSCACL       .1611       .0801       .0538       .0389       .0866       .0931
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .000     P= .008     P= .053     P= .122     P= .005     P= .003

NATT        -.0157      -.0478       .0391       .0026       .0039       .0049
            (  901)     (  902)     (  900)     (  900)     (  898)     (  903)
            P= .319     P= .076     P= .121     P= .469     P= .453     P= .442

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

               INT4       PASTINT1     PASTINT2     PASTINT3     PASTINT4     MARABG

ENROLL         .0298      -.0484       -.0450        .0164        .0090       -.0603
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .186     P= .073      P= .089      P= .311      P= .393      P= .035

CLASNO         .0370      -.0746       -.0332        .0516        .0217       -.0408
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .134     P= .012      P= .160      P= .061      P= .258      P= .110

SCLASS         .1199       .0469       -.0158        .0117        .0907        .1323
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .000     P= .080      P= .318      P= .363      P= .003      P= .000

SCIST          .1082       .0630       -.0263       -.0266        .0661        .0850
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .001     P= .029      P= .215      P= .213      P= .024      P= .005

NEWST         -.0281      -.0567       -.0847       -.0510       -.0220       -.0792
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .200     P= .044      P= .005      P= .063      P= .255      P= .009

GRADST         .0775      -.0097       -.0295        .0193        .0742        .1361
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .010     P= .386      P= .189      P= .282      P= .013      P= .000

LOCAT1        -.0357      -.0412       -.0495        .0021       -.0111       -.0064
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .142     P= .108      P= .069      P= .475      P= .370      P= .423

LOCAT2         .0479       .0180        .0114       -.0336       -.0092       -.0594
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .075     P= .294      P= .367      P= .157      P= .392      P= .037

LOCAT3        -.0113       .0413        .0645        .0456        .0315        .0971
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .368     P= .108      P= .027      P= .086      P= .173      P= .002

ESTBDATE       .0345       .0160        .0088        .0406        .0490        .0383
             (  901)     (  902)      (  900)      (  900)      (  898)      (  903)
             P= .150     P= .315      P= .396      P= .112      P= .071      P= .125

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

                INT4       PASTINT1   PASTINT2   PASTINT3   PASTINT4   MARABG

BUILD1          .0340      .0247      .0449      .0464     -.0237     -.2651
              (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
              P= .154    P= .230    P= .089    P= .082    P= .239    P= .000

BUILD2         -.0340     -.0247     -.0449     -.0464      .0237      .2651
              (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
              P= .154    P= .230    P= .089    P= .082    P= .239    P= .000

STTOTRAT       -.0265      .0188      .0243      .0293     -.0086     -.1317
              (  901)    (  902)    (  900)    (  900)    (  898)    (  903)
              P= .214    P= .286    P= .233    P= .190    P= .398    P= .000


                MARABL     MCAST      MABAT      MATHM      AGET1      AGET2


MARABL         1.0000      .0701      .2793      .3554     -.0717     -.0674
              (    0)    (  912)    (  912)    (  912)    (  903)    (  903)
              P= .       P= .017    P= .000    P= .000    P= .016    P= .021

MCAST           .0701     1.0000     -.0488      .0042      .0013      .0025
              (  912)    (    0)    (  912)    (  912)    (  903)    (  903)
              P= .017    P= .       P= .071    P= .450    P= .484    P= .471

MABAT           .2793     -.0488     1.0000      .4524     -.0571      .0111
              (  912)    (  912)    (    0)    (  912)    (  903)    (  903)
              P= .000    P= .071    P= .       P= .000    P= .043    P= .369

MATHM           .3554      .0042      .4524     1.0000     -.0423     -.0448
              (  912)    (  912)    (  912)    (    0)    (  903)    (  903)
              P= .000    P= .450    P= .000    P= .       P= .102    P= .089

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              MARABL      MCAST      MABAT      MATHM      AGET1      AGET2

AGET1         -.0717      .0013     -.0571     -.0423     1.0000     -.6654
             (  903)    (  903)    (  903)    (  903)    (    0)    (  903)
             P= .016    P= .484    P= .043    P= .102    P= .       P= .000

AGET2         -.0674      .0025      .0111     -.0448     -.6654     1.0000
             (  903)    (  903)    (  903)    (  903)    (  903)    (    0)
             P= .021    P= .471    P= .369    P= .089    P= .000    P= .

AGET3          .1645     -.0047      .0456      .1038     -.1785     -.6157
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .444    P= .085    P= .001    P= .000    P= .000

WHATEA1        .0681     -.0374     -.0496     -.0076      .2565     -.2285
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .020    P= .131    P= .068    P= .409    P= .000    P= .000

WHATEA2       -.0112      .0743     -.0392     -.0387     -.2425      .2051
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .368    P= .013    P= .120    P= .123    P= .000    P= .000

WHATEA3       -.0671     -.0292      .0947      .0462     -.0586      .0628
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .022    P= .191    P= .002    P= .083    P= .039    P= .030

YEARTEA2      -.1316      .0100     -.0251     -.0005      .5109     -.2821
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .382    P= .226    P= .495    P= .000    P= .000

YEARTEA3      -.0386     -.0128      .0049     -.0785      .0935      .0059
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .123    P= .350    P= .441    P= .009    P= .002    P= .430

YEARTEA4       .0622      .0150     -.0099     -.0282     -.6692      .3594
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .031    P= .327    P= .383    P= .199    P= .000    P= .000

DEGREE1        .0046     -.0460      .0254     -.0737      .1360     -.2044
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .445    P= .084    P= .223    P= .013    P= .000    P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

            MARABL      MCAST       MABAT       MATHM       AGET1       AGET2

DEGREE2     -.0046       .0460      -.0254       .0737      -.1360       .2044
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .445     P= .084     P= .223     P= .013     P= .000     P= .000

WHYTE1       .0011      -.0858      -.0642      -.0205       .2201      -.1298
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .486     P= .005     P= .027     P= .269     P= .000     P= .000

WHYTE2      -.0110       .1151      -.0635      -.0071      -.0814       .1223
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .370     P= .000     P= .028     P= .415     P= .007     P= .000

WHYTE3       .0887      -.0242       .0202       .1148       .2134      -.2997
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .004     P= .234     P= .272     P= .000     P= .000     P= .000

WHYTE4       .0322       .0620       .0805       .1482      -.0692       .0141
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .167     P= .031     P= .008     P= .000     P= .019     P= .336

WHYTE5      -.1033      -.1012      -.0499      -.2780      -.1243       .1868
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .001     P= .001     P= .067     P= .000     P= .000     P= .000

DECTEA1      .0418      -.0666       .1104       .0616      -.0608      -.2099
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .105     P= .023     P= .000     P= .032     P= .034     P= .000

DECTEA2      .0887       .0998      -.0176       .0164       .1461      -.0829
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .004     P= .001     P= .299     P= .312     P= .000     P= .006

DECTEA3     -.0132      -.0481       .0059       .0551      -.0359       .0540
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .346     P= .074     P= .430     P= .049     P= .140     P= .053

DECTEA5     -.1189      -.0647      -.0390      -.0677      -.1243       .1868
           ( 903)      ( 903)      ( 903)      ( 903)      ( 903)      ( 903)
           P= .000     P= .026     P= .121     P= .021     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             MARABL      MCAST       MABAT       MATHM       AGET1       AGET2

STUNOCL2      .1079       .0420      -.0043       .0147       .1759      -.0847
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .001     P= .104     P= .449     P= .330     P= .000     P= .005

STUNOCL3      .1044       .0388      -.0042       .0290      -.0280      -.0633
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .001     P= .122     P= .450     P= .192     P= .201     P= .029

STUNOCL4     -.0881       .0026       .0672       .1493      -.0493      -.0139
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .004     P= .469     P= .022     P= .000     P= .069     P= .339

STUNOCL5     -.0428      -.0499      -.1196      -.2490       .0431       .0497
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .099     P= .067     P= .000     P= .000     P= .098     P= .068

STUNOCL6      .0370      -.0056       .1063       .1018      -.0828       .1244
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .133     P= .433     P= .001     P= .001     P= .006     P= .000

CLWEEK2       .1545      -.0480       .0687       .1269       .1787      -.0759
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .075     P= .020     P= .000     P= .000     P= .011

CLWEEK3       .0344       .0304      -.0176       .1563       .0434      -.1634
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .151     P= .181     P= .298     P= .000     P= .096     P= .000

CLWEEK4      -.0997      -.0105      -.0111      -.2111      -.1190       .1968
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .001     P= .376     P= .370     P= .000     P= .000     P= .000

EQUAVA1       .0388       .0753      -.0586      -.0148      -.1063      -.0509
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .122     P= .012     P= .039     P= .329     P= .001     P= .063

EQUAVA2       .0023      -.0032       .0798      -.0074       .2064      -.1316
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .473     P= .462     P= .008     P= .412     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              MARABL      MCAST       MABAT       MATHM       AGET1       AGET2

EQUAVA3       -.0220      -.0349      -.0541       .0153      -.1628       .1640
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .254     P= .148     P= .052     P= .324     P= .000     P= .000

MATADQ        -.0271       .0179      -.0108       .0889      -.0115       .1910
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .208     P= .296     P= .373     P= .004     P= .365     P= .000

TEAOPN1       -.0040      -.0550      -.0170       .0385       .2666      -.3105
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .452     P= .049     P= .305     P= .124     P= .000     P= .000

TEAOPN2       -.0047      -.1075      -.0120       .0384       .0496      -.1091
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .444     P= .001     P= .360     P= .124     P= .068     P= .001

TEAOPN3        .0869      -.0118       .0508       .0391      -.0295       .0012
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .005     P= .361     P= .063     P= .120     P= .188     P= .486

TEAOPN4       -.0886      -.1492       .1008       .0425      -.1234      -.0443
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .004     P= .000     P= .001     P= .101     P= .000     P= .092

TEAOPN5        .0128      -.0589       .0319       .0812      -.1618       .1761
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .351     P= .039     P= .169     P= .007     P= .000     P= .000

TEAOPN6        .0440       .0407       .0456      -.0135       .0444      -.0365
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .093     P= .111     P= .086     P= .343     P= .091     P= .137

MSCACL         .0385       .1373       .0110       .0419      -.0030      -.1092
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .124     P= .000     P= .371     P= .104     P= .464     P= .001

NATT           .0564      -.0276       .0350      -.0310      -.6269       .3144
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .045     P= .204     P= .147     P= .176     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

            MARABL      MCAST      MABAT      MATHM      AGET1      AGET2

ENROLL      -.0491      .0048      .0955     -.0141     -.1551      .1359
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .070    P= .443    P= .002    P= .336    P= .000    P= .000

CLASNO      -.0451      .0523      .0703     -.0343     -.1802      .1839
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .088    P= .058    P= .017    P= .151    P= .000    P= .000

SCLASS       .1006      .1886      .0690      .1274     -.0646      .0225
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .001    P= .000    P= .019    P= .000    P= .026    P= .250

SCIST        .0519      .1042      .0433      .0734     -.0442      .0414
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .059    P= .001    P= .097    P= .014    P= .092    P= .107

NEWST       -.0768     -.0772      .1383      .0310     -.2012      .1530
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .010    P= .010    P= .000    P= .176    P= .000    P= .000

GRADST       .0807      .0645      .0649      .1419     -.2200      .1268
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .008    P= .026    P= .026    P= .000    P= .000    P= .000

LOCAT1      -.0274     -.2160      .0593      .0456     -.3073      .1764
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .206    P= .000    P= .038    P= .086    P= .000    P= .000

LOCAT2      -.0653      .1531     -.0554      .0111      .3456     -.1229
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .025    P= .000    P= .048    P= .369    P= .000    P= .000

LOCAT3       .1399      .1310     -.0164     -.0909      .0004     -.1102
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .000    P= .000    P= .311    P= .003    P= .495    P= .000

ESTBDATE    -.0185      .0237      .0394      .2688      .2372     -.2739
           (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
           P= .289    P= .238    P= .118    P= .000    P= .000    P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              MARABL      MCAST       MABAT       MATHM       AGET1       AGET2

BUILD1        -.1586      -.0230      -.0460      -.2068       .0281       .0979
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .245     P= .084     P= .000     P= .199     P= .002

BUILD2         .1586       .0230       .0460       .2068      -.0281      -.0979
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .245     P= .084     P= .000     P= .199     P= .002

STTOTRAT      -.0998       .0332      -.0877      -.1384       .1871       .0001
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .001     P= .159     P= .004     P= .000     P= .000     P= .499


              AGET3       WHATEA1     WHATEA2     WHATEA3     YEARTEA2    YEARTEA3

AGET3         1.0000       .0305      -.0143      -.0210      -.1674      -.1065
             (    0)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .        P= .180     P= .334     P= .265     P= .000     P= .001

WHATEA1        .0305      1.0000      -.5627      -.5992       .1526      -.1585
             (  903)     (    0)     (  903)     (  903)     (  903)     (  903)
             P= .180     P= .        P= .000     P= .000     P= .000     P= .000

WHATEA2       -.0143      -.5627      1.0000      -.3247      -.2275       .2930
             (  903)     (  903)     (    0)     (  903)     (  903)     (  903)
             P= .334     P= .000     P= .        P= .000     P= .000     P= .000

WHATEA3       -.0210      -.5992      -.3247      1.0000       .0457      -.1024
             (  903)     (  903)     (  903)     (    0)     (  903)     (  903)
             P= .265     P= .000     P= .000     P= .        P= .085     P= .001

YEARTEA2      -.1674       .1526      -.2275       .0457      1.0000      -.1079
             (  903)     (  903)     (  903)     (  903)     (    0)     (  903)
             P= .000     P= .000     P= .000     P= .085     P= .        P= .001

YEARTEA3      -.1065      -.1585       .2930      -.1024      -.1079      1.0000
             (  903)     (  903)     (  903)     (  903)     (  903)     (    0)
             P= .001     P= .000     P= .000     P= .001     P= .001     P= .

YEARTEA4       .2327      -.1202       .0674       .0723      -.7193      -.4575
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .000     P= .021     P= .015     P= .000     P= .000

DEGREE1        .1258      -.1235      -.0421       .1821       .1275       .0811
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .000     P= .103     P= .000     P= .000     P= .007

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             AGET3      WHATEA1     WHATEA2     WHATEA3     YEARTEA2    YEARTEA3

DEGREE2      -.1258       .1235       .0421      -.1821      -.1275      -.0811
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .103     P= .000     P= .000     P= .007

WHYTE1       -.0612       .1477      -.0831      -.0885      -.0620      -.0394
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .033     P= .000     P= .006     P= .004     P= .031     P= .118

WHYTE2       -.0753       .1819      -.1024      -.1090      -.0764      -.0486
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .012     P= .000     P= .001     P= .001     P= .011     P= .072

WHYTE3        .1698       .0196      -.1092       .0834      -.0815      -.0518
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .279     P= .001     P= .006     P= .007     P= .060

WHYTE4        .0545      -.3507       .2474       .1616       .1846       .1174
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .051     P= .000     P= .000     P= .000     P= .000     P= .000

WHYTE5       -.1151       .2778      -.1563      -.1665      -.1166      -.0742
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .000     P= .000     P= .000     P= .013

DECTEA1       .3408       .1359      -.0765      -.0814      -.0571      -.0363
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .000     P= .011     P= .007     P= .043     P= .138

DECTEA2      -.0450       .0211      -.0522       .0264       .1371      -.2295
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .088     P= .264     P= .059     P= .214     P= .000     P= .000

DECTEA3      -.0332      -.0833       .1481      -.0481      -.0337      -.0214
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .159     P= .006     P= .000     P= .074     P= .156     P= .260

DECTEA5      -.1151      -.0687       .0534       .0269      -.1166       .2878
            (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
            P= .000     P= .019     P= .055     P= .209     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             AGET3      WHATEA1    WHATEA2    WHATEA3    YEARTEA2   YEARTEA3

STUNOCL2     -.0740      .1788     -.1006     -.1071     -.0750     -.0477
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .013    P= .000    P= .001    P= .001    P= .012    P= .076

STUNOCL3      .1129     -.0685      .0894     -.0082      .0534      .0519
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .020    P= .004    P= .403    P= .054    P= .059

STUNOCL4      .0703     -.0169     -.1936      .2068      .0463     -.0695
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .017    P= .306    P= .000    P= .000    P= .082    P= .018

STUNOCL5     -.1110      .0001      .2412     -.2337     -.0332      .0803
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .499    P= .000    P= .000    P= .159    P= .008

STUNOCL6     -.0766      .0025     -.1041      .0979     -.0777     -.0494
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .011    P= .470    P= .001    P= .002    P= .010    P= .069

CLWEEK2      -.0886     -.0201     -.1204      .1396     -.0898     -.0571
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .004    P= .274    P= .000    P= .000    P= .003    P= .043

CLWEEK3       .1696      .1288     -.1362     -.0154      .0069     -.0951
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .322    P= .418    P= .002

CLWEEK4      -.1338     -.1215      .1881     -.0432      .0309      .1200
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .097    P= .177    P= .000

EQUAVA1       .1793      .2376     -.1337     -.1424     -.0997     -.0634
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .000    P= .001    P= .028

EQUAVA2      -.0444     -.1831      .1244      .0890      .0558      .0730
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .091    P= .000    P= .000    P= .004    P= .047    P= .014

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              AGET3     WHATEA1    WHATEA2    WHATEA3    YEARTEA2   YEARTEA3

EQUAVA3       -.0443      .0717     -.0628     -.0212     -.0079     -.0445
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .092   P= .016    P= .030    P= .262    P= .406    P= .091

MATADQ        -.2397     -.1301      .0871      .0645      .0445      .2275
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000   P= .000    P= .004    P= .026    P= .091    P= .000

TEAOPN1        .1280      .3447     -.0702     -.3264      .0103     -.0065
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000   P= .000    P= .018    P= .000    P= .378    P= .423

TEAOPN2        .0915     -.0471     -.0706      .1223      .0316      .0356
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .003   P= .079    P= .017    P= .000    P= .171    P= .143

TEAOPN3        .0296      .0139     -.1344      .1142     -.0090     -.0770
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .187   P= .338    P= .000    P= .000    P= .394    P= .010

TEAOPN4        .1886      .0821      .0599     -.1520     -.0525      .1922
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000   P= .007    P= .036    P= .000    P= .057    P= .000

TEAOPN5       -.0614     -.0773     -.2587      .3390     -.0840     -.0487
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .033   P= .010    P= .000    P= .000    P= .006    P= .072

TEAOPN6        .0013     -.2332     -.1282      .3909      .1089      .1725
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .485   P= .000    P= .000    P= .000    P= .001    P= .000

MSCACL         .1471      .1905      .0193     -.2367      .0729     -.1795
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000   P= .000    P= .281    P= .000    P= .014    P= .000

NATT           .2473     -.3427      .3006      .1010     -.3229     -.0135
              (  903)   (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000   P= .000    P= .000    P= .001    P= .000    P= .343

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              AGET3      WHATEA1     WHATEA2     WHATEA3    YEARTEA2    YEARTEA3

ENROLL        -.0154       .0755      -.0888      -.0005      -.0557      -.1596
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .322     P= .012     P= .004     P= .494     P= .047     P= .000

CLASNO        -.0522       .0528      -.0283      -.0330      -.1320      -.1191
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .059     P= .056     P= .198     P= .161     P= .000     P= .000

SCLASS         .0385       .0802       .0182      -.1094       .0031      -.0694
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .124     P= .008     P= .292     P= .000     P= .462     P= .019

SCIST         -.0080       .1189      -.0032      -.1329       .0951      -.0750
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .405     P= .000     P= .461     P= .000     P= .002     P= .012

NEWST          .0107       .0226      -.0100      -.0162      -.1074      -.1909
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .375     P= .249     P= .382     P= .314     P= .001     P= .000

GRADST         .0651       .1084       .0312      -.1542      -.1464      -.0731
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .025     P= .001     P= .174     P= .000     P= .000     P= .014

LOCAT1         .0918       .0315       .0253      -.0606      -.2388      -.0069
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .003     P= .172     P= .224     P= .034     P= .000     P= .418

LOCAT2        -.2028      -.0260      -.0659       .0936       .3533      -.0742
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .217     P= .024     P= .002     P= .000     P= .013

LOCAT3         .1448      -.0137       .0545      -.0371      -.1231       .1193
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .340     P= .051     P= .133     P= .000     P= .000

ESTBDATE       .1106      -.0484      -.1291       .1803       .1368      -.0181
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .073     P= .000     P= .000     P= .000     P= .293

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             AGET3     WHATEA1    WHATEA2    WHATEA3    YEARTEA2   YEARTEA3

BUILD1      -.1587     -.0189      .0215      .0008      .1737      .0764
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .000    P= .285    P= .260    P= .490    P= .000    P= .011

BUILD2       .1587      .0189     -.0215     -.0008     -.1737     -.0764
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .000    P= .285    P= .260    P= .490    P= .000    P= .011

STTOTRAT    -.1977     -.1057      .1362     -.0109      .0324      .2717
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .000    P= .001    P= .000    P= .371    P= .166    P= .000


            YEARTEA4   DEGREE1    DEGREE2    WHYTE1     WHYTE2     WHYTE3

YEARTEA4    1.0000     -.1773      .1773      .0862      .1062     -.1430
            (    0)    ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .       P= .000    P= .000    P= .005    P= .001    P= .000

DEGREE1     -.1773     1.0000    -1.0000      .0466     -.5987      .0612
            ( 903)     (    0)    ( 903)     ( 903)     ( 903)     ( 903)
            P= .000    P= .       P= .000    P= .081    P= .000    P= .033

DEGREE2      .1773    -1.0000     1.0000     -.0466      .5987     -.0612
            ( 903)     ( 903)     (    0)    ( 903)     ( 903)     ( 903)
            P= .000    P= .000    P= .       P= .081    P= .000    P= .033

WHYTE1       .0862      .0466     -.0466     1.0000     -.0279     -.0298
            ( 903)     ( 903)     ( 903)     (    0)    ( 903)     ( 903)
            P= .005    P= .081    P= .081    P= .       P= .201    P= .186

WHYTE2       .1062     -.5987      .5987     -.0279     1.0000     -.0367
            ( 903)     ( 903)     ( 903)     ( 903)     (    0)    ( 903)
            P= .001    P= .000    P= .000    P= .201    P= .       P= .136

WHYTE3      -.1430      .0612     -.0612     -.0298     -.0367     1.0000
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     (    0)
            P= .000    P= .033    P= .033    P= .186    P= .136    P= .

WHYTE4      -.1259      .4494     -.4494     -.3359     -.4137     -.4414
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .000    P= .000    P= .000    P= .000    P= .000    P= .000

WHYTE5       .1621     -.3012      .3012     -.0426     -.0525     -.0560
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .000    P= .000    P= .000    P= .100    P= .058    P= .046

DECTEA1      .0793      .0429     -.0429     -.0208     -.0257     -.0274
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .009    P= .099    P= .099    P= .266    P= .220    P= .205

DECTEA2     -.0105     -.1030      .1030      .0501      .0617      .0658
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .376    P= .001    P= .001    P= .066    P= .032    P= .024

DECTEA3      .0468      .0253     -.0253     -.0123     -.0152     -.0162
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .080    P= .224    P= .224    P= .356    P= .325    P= .314

DECTEA5     -.0436      .0877     -.0877     -.0426     -.0525     -.0560
            ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
            P= .095    P= .004    P= .004    P= .100    P= .058    P= .046

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

            YEARTEA4    DEGREE1     DEGREE2     WHYTE1      WHYTE2      WHYTE3

STUNOCL2     -.1142      .0564      -.0564      -.0274      -.0338      -.0360
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .045    P= .045    P= .205    P= .155    P= .140

STUNOCL3     -.0382      .1241      -.1241      -.0603      -.0743      -.0793
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .126    P= .000    P= .000    P= .035    P= .013    P= .009

STUNOCL4      .0023     -.0913       .0913      -.0797       .1635       .1744
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .472    P= .003    P= .003    P= .008    P= .000    P= .000

STUNOCL5      .0295     -.0429       .0429       .1665      -.1020      -.1089
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .188    P= .099    P= .099    P= .000    P= .001    P= .001

STUNOCL6      .1080      .0584      -.0584      -.0284      -.0350      -.0373
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .001    P= .040    P= .040    P= .197    P= .147    P= .131

CLWEEK2      -.1095      .0675      -.0675      -.0328      -.0404       .4878
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .021    P= .021    P= .162    P= .112    P= .000

CLWEEK3       .0633     -.2939       .2939       .0524       .1760      -.0336
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .029    P= .000    P= .000    P= .058    P= .000    P= .157

CLWEEK4      -.0178      .2682      -.2682      -.0391      -.1605      -.1713
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .297    P= .000    P= .000    P= .120    P= .000    P= .000

EQUAVA1       .1386     -.4392       .4392      -.0364       .7657      -.0479
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .137    P= .000    P= .075

EQUAVA2      -.1496      .2420      -.2420       .0124      -.2589      -.0428
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .355    P= .000    P= .100

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              YEARTEA4    DEGREE1     DEGREE2     WHYTE1      WHYTE2      WHYTE3

EQUAVA3         .0867      -.0313       .0313       .0055      -.1166       .0692
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .005     P= .173     P= .173     P= .434     P= .000     P= .019

MATADQ         -.1142       .1826      -.1826       .1520      -.1093      -.1166
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .000     P= .000     P= .000     P= .000     P= .001     P= .000

TEAOPN1        -.0733       .0139      -.0139       .1107       .2718      -.0572
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .014     P= .339     P= .339     P= .000     P= .000     P= .043

TEAOPN2        -.0305       .1921      -.1921       .2017      -.0330       .0973
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .180     P= .000     P= .000     P= .000     P= .161     P= .002

TEAOPN3        -.0033       .3084      -.3084      -.0169      -.2650       .2383
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .460     P= .000     P= .000     P= .306     P= .000     P= .000

TEAOPN4        -.0165       .0990      -.0990      -.0582      -.2004      -.2138
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .310     P= .001     P= .001     P= .040     P= .000     P= .000

TEAOPN5         .0508       .1154      -.1154      -.0761      -.0033       .1030
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .064     P= .000     P= .000     P= .011     P= .461     P= .001

TEAOPN6        -.1360       .2315      -.2315      -.0530      -.2276       .0117
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .000     P= .000     P= .000     P= .056     P= .000     P= .362

MSCACL         -.0199      -.2454       .2454      -.0864       .2353       .0723
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .275     P= .000     P= .000     P= .005     P= .000     P= .015

NATT            .4149       .3059      -.3059       .0916      -.3047      -.1286
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .000     P= .000     P= .000     P= .003     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             YEARTEA4   DEGREE1    DEGREE2    WHYTE1     WHYTE2     WHYTE3

ENROLL         .2197    -.0342      .0342    -.0028      .0347    -.1147
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .000   P= .152    P= .152   P= .466    P= .149   P= .000

CLASNO         .2562    -.0210      .0210    -.0435      .0303    -.1828
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .000   P= .264    P= .264   P= .096    P= .182   P= .000

SCLASS         .0512    -.2504      .2504    -.1812      .1912    -.0324
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .062   P= .000    P= .000   P= .000    P= .000   P= .165

SCIST         -.0201    -.2262      .2262    -.1255      .1737    -.0154
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .273   P= .000    P= .000   P= .000    P= .000   P= .322

NEWST          .2577    -.0673      .0673    -.0329     -.0702    -.1088
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .000   P= .022    P= .022   P= .162    P= .017   P= .001

GRADST         .1745    -.1594      .1594    -.1422     -.0425    -.0099
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .000   P= .000    P= .000   P= .000    P= .101   P= .383

LOCAT1         .2300     .0678     -.0678     .0942     -.2963     .1237
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .000   P= .021    P= .021   P= .002    P= .000   P= .000

LOCAT2        -.2992    -.1398      .1398    -.0751      .3715    -.0987
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .000   P= .000    P= .000   P= .012    P= .000   P= .001

LOCAT3         .0587     .0925     -.0925    -.0450     -.0554    -.0591
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .039   P= .003    P= .003   P= .089    P= .048   P= .038

ESTBDATE      -.1138    -.0479      .0479     .1698      .0094     .0900
             (  903)   (  903)    (  903)   (  903)    (  903)   (  903)
             P= .000   P= .075    P= .075   P= .000    P= .389   P= .003

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

            YEARTEA4   DEGREE1    DEGREE2    WHYTE1     WHYTE2     WHYTE3

BUILD1       -.0651      .1789     -.1789      .1093      .1347     -.0887
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .025    P= .000    P= .000    P= .000    P= .000    P= .004

BUILD2        .0651     -.1789      .1789     -.1093     -.1347      .0887
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .025    P= .000    P= .000    P= .000    P= .000    P= .004

STTOTRAT     -.1522      .1477     -.1477     -.0384      .0101     -.2257
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .125    P= .381    P= .000


            WHYTE4     WHYTE5     DECTEA1    DECTEA2    DECTEA3    DECTEA5

WHYTE4       1.0000     -.6318      .0621     -.1491      .0366      .1269
            (    0)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .       P= .000    P= .031    P= .000    P= .136    P= .000

WHYTE5       -.6318     1.0000     -.0392      .0942     -.0232     -.0801
            (  903)    (    0)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .       P= .120    P= .002    P= .244    P= .008

DECTEA1       .0621     -.0392     1.0000     -.4163     -.0113     -.0392
            (  903)    (  903)    (    0)    (  903)    (  903)    (  903)
            P= .031    P= .120    P= .       P= .000    P= .367    P= .120

DECTEA2      -.1491      .0942     -.4163     1.0000     -.2458     -.8509
            (  903)    (  903)    (  903)    (    0)    (  903)    (  903)
            P= .000    P= .002    P= .000    P= .       P= .000    P= .000

DECTEA3       .0366     -.0232     -.0113     -.2458     1.0000     -.0232
            (  903)    (  903)    (  903)    (  903)    (    0)    (  903)
            P= .136    P= .244    P= .367    P= .000    P= .       P= .244

DECTEA5       .1269     -.0801     -.0392     -.8509     -.0232     1.0000
            (  903)    (  903)    (  903)    (  903)    (  903)    (    0)
            P= .000    P= .008    P= .120    P= .000    P= .244    P= .

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              WHYTE4     WHYTE5     DECTEA1    DECTEA2    DECTEA3    DECTEA5

STUNOCL2       .0816     -.0516     -.0252      .0606     -.0149     -.0516
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .007    P= .061    P= .224    P= .034    P= .327    P= .061

STUNOCL3       .1796     -.1135      .3456     -.1128      .2040     -.1135
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .000    P= .000    P= .000    P= .000

STUNOCL4      -.0661     -.0996     -.1571      .2283     -.0927     -.1507
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .024    P= .001    P= .000    P= .000    P= .003    P= .000

STUNOCL5      -.1397      .2542     -.0763     -.2281     -.0450      .3142
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .011    P= .000    P= .088    P= .000

STUNOCL6       .0845     -.0534     -.0261      .0627     -.0154     -.0534
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .006    P= .054    P= .217    P= .030    P= .322    P= .054

CLWEEK2       -.1731     -.0617     -.0302      .0726     -.0178     -.0617
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .032    P= .182    P= .015    P= .296    P= .032

CLWEEK3       -.0331     -.0782     -.1459     -.0345      .0776      .0910
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .160    P= .009    P= .000    P= .150    P= .010    P= .003

CLWEEK4        .1062      .1049      .1599      .0043     -.0708     -.0659
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .001    P= .001    P= .000    P= .449    P= .017    P= .024

EQUAVA1       -.2808     -.0685     -.0335      .0806     -.0198     -.0685
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .020    P= .157    P= .008    P= .276    P= .020

EQUAVA2        .2873     -.2080      .0992     -.1913     -.1142      .2027
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .001    P= .000    P= .000    P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

              WHYTE4      WHYTE5     DECTEA1     DECTEA2     DECTEA3     DECTEA5

EQUAVA3       -.1593       .2532     -.0871       .1601       .1300     -.1781
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .000    P= .004    P= .000    P= .000    P= .000

MATADQ         .1693     -.1669     -.0817       .1455       .1387     -.1669
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .000    P= .007    P= .000    P= .000    P= .000

TEAOPN1        .0478     -.2746       .2031     -.0421     -.0793     -.0327
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .075    P= .000    P= .000    P= .103    P= .009    P= .163

TEAOPN2        .1069     -.3135     -.0247       .0593     -.0146     -.0505
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .001    P= .000    P= .229    P= .037    P= .331    P= .065

TEAOPN3        .0386     -.0374       .1669     -.0746       .0985     -.0318
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .123    P= .131    P= .000    P= .012    P= .002    P= .170

TEAOPN4        .2647     -.0519       .1707     -.1278       .1008       .0263
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .060    P= .000    P= .000    P= .001    P= .215

TEAOPN5        .1310     -.2163     -.0024     -.2287       .0983       .2321
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .000    P= .471    P= .000    P= .002    P= .000

TEAOPN6        .2558     -.1873       .0320     -.0014       .1382     -.0579
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .000    P= .168    P= .484    P= .000    P= .041

MSCACL        -.1412       .0361       .1484     -.1578     -.0259       .1114
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .139    P= .000    P= .000    P= .219    P= .000

NATT           .2285     -.0751       .0843     -.1525     -.1344       .1723
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .012    P= .006    P= .000    P= .000    P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              WHYTE4     WHYTE5     DECTEA1    DECTEA2    DECTEA3    DECTEA5

ENROLL        -.0382      .1155      .0507      .0343     -.2351      .0074
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .126    P= .000    P= .064    P= .151    P= .000    P= .413

CLASNO         .0343      .0877      .0749      .0349     -.2952      .0128
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .152    P= .004    P= .012    P= .147    P= .000    P= .351

SCLASS         .0082     -.0171      .0491      .0951     -.1927     -.0744
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .403    P= .304    P= .070    P= .002    P= .000    P= .013

SCIST         -.0653      .0559      .0041      .0403     -.2065      .0158
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .025    P= .047    P= .451    P= .113    P= .000    P= .317

NEWST         -.0477      .2135      .1067      .0472     -.2059     -.0455
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .076    P= .000    P= .001    P= .078    P= .000    P= .086

GRADST         .0108      .1008      .1163      .0196     -.1669     -.0309
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .373    P= .001    P= .000    P= .278    P= .000    P= .177

LOCAT1        -.0823      .1771      .0867     -.1588     -.1307      .1771
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .007    P= .000    P= .005    P= .000    P= .000    P= .000

LOCAT2         .0007     -.1413     -.0691      .1105      .1639     -.1413
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .491    P= .000    P= .019    P= .000    P= .000    P= .000

LOCAT3         .1339     -.0846     -.0414      .0994     -.0244     -.0846
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .006    P= .107    P= .001    P= .232    P= .006

ESTBDATE       .1739     -.4147      .0856     -.0598      .1549     -.0240
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)     ( 903)
             P= .000    P= .000    P= .005    P= .036    P= .000    P= .235

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              WHYTE4      WHYTE5      DECTEA1     DECTEA2     DECTEA3     DECTEA5

BUILD1        -.0448      -.0253      -.1906      -.1096       .0594       .2057
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .089     P= .224     P= .000     P= .000     P= .037     P= .000

BUILD2         .0448       .0253       .1906       .1096      -.0594      -.2057
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .089     P= .224     P= .000     P= .000     P= .037     P= .000

STTOTRAT       .2293      -.1480      -.0537      -.1534       .3959       .0804
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .000     P= .054     P= .000     P= .000     P= .008

              STUNOCL2    STUNOCL3    STUNOCL4    STUNOCL5    STUNOCL6    CLWEEK2

STUNOCL2      1.0000      -.0730      -.2066      -.1003      -.0343      -.0397
             (    0)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .        P= .014     P= .000     P= .001     P= .151     P= .117

STUNOCL3      -.0730      1.0000      -.4546      -.2207      -.0756      -.0874
             (  903)     (    0)     (  903)     (  903)     (  903)     (  903)
             P= .014     P= .        P= .000     P= .000     P= .012     P= .004

STUNOCL4      -.2066      -.4546      1.0000      -.6243      -.2138       .1923
             (  903)     (  903)     (    0)     (  903)     (  903)     (  903)
             P= .000     P= .000     P= .        P= .000     P= .000     P= .000

STUNOCL5      -.1003      -.2207      -.6243      1.0000      -.1038      -.1201
             (  903)     (  903)     (  903)     (    0)     (  903)     (  903)
             P= .001     P= .000     P= .000     P= .        P= .001     P= .000

STUNOCL6      -.0343      -.0756      -.2138      -.1038      1.0000      -.0411
             (  903)     (  903)     (  903)     (  903)     (    0)     (  903)
             P= .151     P= .012     P= .000     P= .001     P= .        P= .109

CLWEEK2       -.0397      -.0874       .1923      -.1201      -.0411      1.0000
             (  903)     (  903)     (  903)     (  903)     (  903)     (    0)
             P= .117     P= .004     P= .000     P= .000     P= .109     P= .

CLWEEK3        .1729      -.2489       .2628      -.1704      -.0159      -.2298
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .000     P= .000     P= .000     P= .316     P= .000

CLWEEK4       -.1578       .2879      -.3461       .2225       .0334      -.1889
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .000     P= .000     P= .000     P= .158     P= .000

EQUAVA1       -.0441      -.0970       .2135      -.1333      -.0456      -.0528
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .093     P= .002     P= .000     P= .000     P= .085     P= .056

EQUAVA2       -.0554      -.1263      -.1125       .2003       .1350       .1561
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .048     P= .000     P= .000     P= .000     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             STUNOCL2  STUNOCL3  STUNOCL4  STUNOCL5  STUNOCL6   CLWEEK2

EQUAVA3         .0805     .1819     .0098    -.1427    -.1186    -.1372
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .008   P= .000   P= .384   P= .000   P= .000   P= .000

MATADQ          .0936     .3499    -.0310    -.2408    -.1112    -.1286
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .002   P= .000   P= .176   P= .000   P= .000   P= .000

TEAOPN1         .0529     .0643    -.1618     .0440     .1653    -.0884
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .056   P= .027   P= .000   P= .093   P= .000   P= .004

TEAOPN2        -.0325     .3279    -.0225    -.2136    -.0336     .1388
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .165   P= .000   P= .250   P= .000   P= .157   P= .000

TEAOPN3        -.0205     .4069    -.1597    -.0722    -.1494     .1086
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .270   P= .000   P= .000   P= .015   P= .000   P= .001

TEAOPN4         .0138     .0933     .0082    -.1464     .1268    -.2357
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .340   P= .003   P= .402   P= .000   P= .000   P= .000

TEAOPN5         .0045     .0947     .0700    -.1088    -.1220     .1389
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .447   P= .002   P= .018   P= .001   P= .000   P= .000

TEAOPN6         .0421     .3031    -.0441    -.1711    -.0984    -.0970
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .103   P= .000   P= .093   P= .000   P= .002   P= .002

MSCACL          .1092    -.2177     .0245     .0659     .0874    -.1712
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .001   P= .000   P= .231   P= .024   P= .004   P= .000

NATT           -.1013    -.0377    -.0540     .1815    -.1044    -.0949
              (  903)   (  903)   (  903)   (  903)   (  903)   (  903)
              P= .001   P= .129   P= .053   P= .000   P= .001   P= .002

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              STUNOCL2   STUNOCL3   STUNOCL4   STUNOCL5   STUNOCL6   CLWEEK2

ENROLL         -.2817     -.3503      .1719      .0387      .3791      .1063
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .000    P= .123    P= .000    P= .001

CLASNO         -.1788     -.2140      .1212     -.0287      .3153      .0477
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .000    P= .194    P= .000    P= .076

SCLASS         -.1866     -.1513      .0401      .0706      .1945      .1457
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .114    P= .017    P= .000    P= .000

SCIST          -.2820     -.3171      .0573      .2489      .1409      .1796
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .043    P= .000    P= .000    P= .000

NEWST          -.3099     -.2406      .0676      .1080      .3216      .1119
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .021    P= .001    P= .000    P= .000

GRADST         -.2271     -.0751      .0124      .0621      .1845      .1405
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .012    P= .355    P= .031    P= .000    P= .000

LOCAT1         -.2912     -.2271      .0541      .1928      .1180      .1364
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .052    P= .000    P= .000    P= .000

LOCAT2          .1450      .0167      .0600     -.1041     -.0941     -.1088
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .308    P= .036    P= .001    P= .002    P= .001

LOCAT3          .2662      .3479     -.1760     -.1645     -.0563     -.0652
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .000    P= .000    P= .045    P= .025

ESTBDATE        .1375      .2772      .2543     -.5521     -.0707     -.0840
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .000    P= .000    P= .017    P= .006

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             STUNOCL2   STUNOCL3   STUNOCL4   STUNOCL5   STUNOCL6   CLWEEK2

BUILD1        -.2507     -.4775      .2090      .1905      .1370     -.0541
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .000    P= .000    P= .000    P= .052

BUILD2         .2507      .4775     -.2090     -.1905     -.1370      .0541
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .000    P= .000    P= .000    P= .052

STTOTRAT       .2287      .3767     -.1607     -.1473     -.1564     -.2169
             (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .000    P= .000    P= .000    P= .000


             CLWEEK3    CLWEEK4    EQUAVA1    EQUAVA2    EQUAVA3    MATADQ

CLWEEK3       1.0000     -.9123      .2298     -.1876      .0804     -.0434
             (    0)    (  903)    (  903)    (  903)    (  903)    (  903)
             P= .       P= .000    P= .000    P= .000    P= .008    P= .096

CLWEEK4       -.9123     1.0000     -.2097      .1236     -.0234      .0979
             (  903)    (    0)    (  903)    (  903)    (  903)    (  903)
             P= .000    P= .       P= .000    P= .000    P= .241    P= .002

EQUAVA1        .2298     -.2097     1.0000     -.3382     -.1523     -.1428
             (  903)    (  903)    (    0)    (  903)    (  903)    (  903)
             P= .000    P= .000    P= .       P= .000    P= .000    P= .000

EQUAVA2       -.1876      .1236     -.3382     1.0000     -.8786     -.3318
             (  903)    (  903)    (  903)    (    0)    (  903)    (  903)
             P= .000    P= .000    P= .000    P= .       P= .000    P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

                CLWEEK3     CLWEEK4     EQUAVA1     EQUAVA2     EQUAVA3     MATADQ

EQUAVA3           .0804      -.0234      -.1523      -.8786      1.0000       .4209
                (  903)     (  903)     (  903)     (  903)     (    0)     (  903)
                P= .008     P= .241     P= .000     P= .000     P= .        P= .000

MATADQ           -.0434       .0979      -.1428      -.3318       .4209      1.0000
                (  903)     (  903)     (  903)     (  903)     (  903)     (    0)
                P= .096     P= .002     P= .000     P= .000     P= .000     P= .

TEAOPN1           .0400      -.0031       .1191       .0303      -.0923       .0416
                (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
                P= .115     P= .463     P= .000     P= .181     P= .003     P= .106

TEAOPN2          -.0699       .0121      -.0432      -.1602       .1901       .3868
                (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
                P= .018     P= .358     P= .098     P= .000     P= .000     P= .000

TEAOPN3          -.1884       .1444      -.3461      -.2370       .4245       .1905
                (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
                P= .000     P= .000     P= .000     P= .000     P= .000     P= .000

TEAOPN4          -.1256       .2259      -.2617       .0108       .1214       .0621
                (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
                P= .000     P= .000     P= .000     P= .372     P= .000     P= .031

TEAOPN5          -.1186       .0612      -.1224      -.0959       .1628       .1687
                (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
                P= .000     P= .033     P= .000     P= .002     P= .000     P= .000

TEAOPN6          -.0058       .0466      -.2972      -.0937       .2493       .2064
                (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
                P= .431     P= .081     P= .000     P= .002     P= .000     P= .000

MSCACL            .2092      -.1391       .0962       .1573      -.2140      -.4323
                (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
                P= .000     P= .000     P= .002     P= .000     P= .000     P= .000

NATT             -.0981       .1389      -.1798       .1597      -.0765       .1081
                (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
                P= .002     P= .000     P= .000     P= .000     P= .011     P= .001

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              CLWEEK3    CLWEEK4    EQUAVA1    EQUAVA2    EQUAVA3    MATADQ

ENROLL          .0450     -.0901      .1384      .2951     -.3802     -.3924
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .088    P= .003    P= .000    P= .000    P= .000    P= .000

CLASNO          .0232     -.0434      .1126      .2158     -.2838     -.2636
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .244    P= .096    P= .000    P= .000    P= .000    P= .000

SCLASS          .0079     -.0693      .1842      .2917     -.3998     -.3656
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .406    P= .019    P= .000    P= .000    P= .000    P= .000

SCIST          -.0162     -.0592      .1799      .3549     -.4640     -.4612
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .313    P= .038    P= .000    P= .000    P= .000    P= .000

NEWST          -.0879      .0416      .0066      .2753     -.2925     -.2324
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .004    P= .106    P= .421    P= .000    P= .000    P= .000

GRADST          .0284     -.0878     -.0105      .1904     -.1947     -.1626
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .197    P= .004    P= .376    P= .000    P= .000    P= .000

LOCAT1          .0178     -.0754     -.1716      .1765     -.0983     -.1658
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .297    P= .012    P= .000    P= .000    P= .002    P= .000

LOCAT2          .0073      .0384      .2428     -.1347      .0183      .0795
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .413    P= .124    P= .000    P= .000    P= .292    P= .008

LOCAT3         -.0398      .0676     -.0723     -.0932      .1346      .1560
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .116    P= .021    P= .015    P= .003    P= .000    P= .000

ESTBDATE        .2750     -.2421     -.0427     -.2144      .2468      .4167
              (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
              P= .000    P= .000    P= .100    P= .000    P= .000    P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
---- PEARSON  CORRELATION  COEFFICIENTS -

            CLWEEK3    CLWEEK4    EQUAVA1    EQUAVA2    EQUAVA3    MATADQ

BUILD1        .0332     -.0108      .1759      .1391     -.2354    -.3486
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)    ( 903)
             P= .159    P= .373    P= .000    P= .000    P= .000   P= .000

BUILD2       -.0332      .0108     -.1759     -.1391      .2354     .3486
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)    ( 903)
             P= .159    P= .373    P= .000    P= .000    P= .000   P= .000

STTOTRAT     -.0301      .1216     -.0653     -.2073      .2508     .3922
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)    ( 903)
             P= .183    P= .000    P= .025    P= .000    P= .000   P= .000


            TEAOPN1    TEAOPN2    TEAOPN3    TEAOPN4    TEAOPN5    TEAOPN6

TEAOPN1      1.0000      .3843      .0794      .3775      .2134    -.0495
             (   0)     ( 903)     ( 903)     ( 903)     ( 903)    ( 903)
             P= .       P= .000    P= .008    P= .000    P= .000   P= .069

TEAOPN2       .3843     1.0000      .4275      .4433      .4810     .2988
             ( 903)     (   0)     ( 903)     ( 903)     ( 903)    ( 903)
             P= .000    P= .       P= .000    P= .000    P= .000   P= .000

TEAOPN3       .0794      .4275     1.0000      .2227      .4073     .4600
             ( 903)     ( 903)     (   0)     ( 903)     ( 903)    ( 903)
             P= .008    P= .000    P= .       P= .000    P= .000   P= .000

TEAOPN4       .3775      .4433      .2227     1.0000      .2185     .1974
             ( 903)     ( 903)     ( 903)     (   0)     ( 903)    ( 903)
             P= .000    P= .000    P= .000    P= .       P= .000   P= .000

TEAOPN5       .2134      .4810      .4073      .2185     1.0000     .4928
             ( 903)     ( 903)     ( 903)     ( 903)     (   0)    ( 903)
             P= .000    P= .000    P= .000    P= .000    P= .      P= .000

TEAOPN6      -.0495      .2988      .4600      .1974      .4928    1.0000
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)    (   0)
             P= .069    P= .000    P= .000    P= .000    P= .000   P= .

MSCACL        .1181     -.3644     -.0436     -.0906     -.0527    -.1363
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)    ( 903)
             P= .000    P= .000    P= .095    P= .003    P= .057   P= .000

NATT         -.2817     -.0051      .0716     -.0143      .0229    -.0569
             ( 903)     ( 903)     ( 903)     ( 903)     ( 903)    ( 903)
             P= .000    P= .439    P= .016    P= .334    P= .246   P= .044

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

             TEAOPN1     TEAOPN2     TEAOPN3     TEAOPN4     TEAOPN5     TEAOPN6

ENROLL        -.1397      -.1822      -.2766      -.0318      -.2406      -.4291
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .000     P= .000     P= .000     P= .170     P= .000     P= .000

CLASNO        -.0975      -.1530      -.2601      -.0249      -.1974      -.3735
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .002     P= .000     P= .000     P= .227     P= .000     P= .000

SCLASS        -.1016      -.4382      -.3387      -.1925      -.2436      -.3292
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .001     P= .000     P= .000     P= .000     P= .000     P= .000

SCIST         -.1001      -.4550      -.3539      -.2033      -.2689      -.4598
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .001     P= .000     P= .000     P= .000     P= .000     P= .000

NEWST         -.0516      -.0897      -.1469       .1291      -.2209      -.4983
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .061     P= .003     P= .000     P= .000     P= .000     P= .000

GRADST        -.0928      -.2767      -.1953      -.0056      -.1372      -.3837
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .003     P= .000     P= .000     P= .433     P= .000     P= .000

LOCAT1        -.0863       .0068      -.0595       .1778      -.0100      -.3637
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .005     P= .419     P= .037     P= .000     P= .382     P= .000

LOCAT2         .0698      -.1184      -.0816      -.2476       .0217       .1597
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .018     P= .000     P= .007     P= .000     P= .258     P= .000

LOCAT3         .0397       .1613       .2164       .0693      -.0151       .3635
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .116     P= .000     P= .000     P= .019     P= .325     P= .000

ESTBDATE       .1045       .3486       .0506       .0879       .1892       .3045
             (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
             P= .001     P= .000     P= .064     P= .004     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

              TEAOPN1     TEAOPN2     TEAOPN3     TEAOPN4     TEAOPN5     TEAOPN6

BUILD1         -.0839      -.1286      -.1577      -.1061      -.1634      -.0625
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .006     P= .000     P= .000     P= .001     P= .000     P= .030

BUILD2          .0839       .1286       .1577       .1061       .1634       .0625
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .006     P= .000     P= .000     P= .001     P= .000     P= .030

STTOTRAT        .0878       .0999       .1057       .1109       .0747       .4061
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .004     P= .001     P= .001     P= .000     P= .012     P= .000

              MSCACL      NATT        ENROLL      CLASNO      SCLASS      SCIST

MSCACL         1.0000      -.0438       .0933       .0315       .3715       .3949
              (    0)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .        P= .094     P= .003     P= .173     P= .000     P= .000

NATT           -.0438      1.0000       .1404       .1414      -.0364       .0112
              (  903)     (    0)     (  903)     (  903)     (  903)     (  903)
              P= .094     P= .        P= .000     P= .000     P= .137     P= .368

ENROLL          .0933       .1404      1.0000       .9115       .6467       .6835
              (  903)     (  903)     (    0)     (  903)     (  903)     (  903)
              P= .003     P= .000     P= .        P= .000     P= .000     P= .000

CLASNO          .0315       .1414       .9115      1.0000       .6698       .5841
              (  903)     (  903)     (  903)     (    0)     (  903)     (  903)
              P= .173     P= .000     P= .000     P= .        P= .000     P= .000

SCLASS          .3715      -.0364       .6467       .6698      1.0000       .9141
              (  903)     (  903)     (  903)     (  903)     (    0)     (  903)
              P= .000     P= .137     P= .000     P= .000     P= .        P= .000

SCIST           .3949       .0112       .6835       .5841       .9141      1.0000
              (  903)     (  903)     (  903)     (  903)     (  903)     (    0)
              P= .000     P= .368     P= .000     P= .000     P= .000     P= .

NEWST          -.0165       .2517       .8653       .7766       .5232       .5784
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .310     P= .000     P= .000     P= .000     P= .000     P= .000

GRADST          .1430       .1513       .6453       .7235       .8368       .7516
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .000     P= .000     P= .000     P= .000     P= .000     P= .000

LOCAT1         -.1599       .3903       .5505       .5175       .2674       .3668
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .000     P= .000     P= .000     P= .000     P= .000     P= .000

LOCAT2          .1663      -.4892      -.3085      -.3566      -.1219      -.1227
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .000     P= .000     P= .000     P= .000     P= .000     P= .000

LOCAT3          .0199       .0727      -.4530      -.3289      -.2607      -.4226
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .275     P= .014     P= .000     P= .000     P= .000     P= .000

ESTBDATE       -.0610      -.2253      -.4483      -.3391      -.3553      -.5466
              (  903)     (  903)     (  903)     (  903)     (  903)     (  903)
              P= .034     P= .000     P= .000     P= .000     P= .000     P= .000

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S -

             MSCACL      NATT       ENROLL     CLASNO     SCLASS      SCIST

BUILD1        .0553      .0194      .3092      .0825     -.1122      .1116
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .048    P= .280    P= .000    P= .007    P= .000    P= .000

BUILD2       -.0553     -.0194     -.3092     -.0825      .1122     -.1116
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .048    P= .280    P= .000    P= .007    P= .000    P= .000

STTOTRAT     -.2565     -.2217     -.6309     -.4641     -.4943     -.6444
            (  903)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .000    P= .000    P= .000


             NEWST      GRADST     LOCAT1     LOCAT2     LOCAT3     ESTBDATE


NEWST        1.0000      .6524      .6428     -.4346     -.4207     -.4372
            (    0)    (  903)    (  903)    (  903)    (  903)    (  903)
            P= .       P= .000    P= .000    P= .000    P= .000    P= .000

GRADST        .6524     1.0000      .6441     -.4899     -.3423     -.3380
            (  903)    (    0)    (  903)    (  903)    (  903)    (  903)
            P= .000    P= .       P= .000    P= .000    P= .000    P= .000

LOCAT1        .6428      .6441     1.0000     -.7976     -.4776     -.3732
            (  903)    (  903)    (    0)    (  903)    (  903)    (  903)
            P= .000    P= .000    P= .       P= .000    P= .000    P= .000

LOCAT2       -.4346     -.4899     -.7976     1.0000     -.1491      .2194
            (  903)    (  903)    (  903)    (    0)    (  903)    (  903)
            P= .000    P= .000    P= .000    P= .       P= .000    P= .000

LOCAT3       -.4207     -.3423     -.4776     -.1491     1.0000      .2922
            (  903)    (  903)    (  903)    (  903)    (    0)    (  903)
            P= .000    P= .000    P= .000    P= .000    P= .       P= .000

ESTBDATE     -.4372     -.3380     -.3732      .2194      .2922     1.0000
            (  903)    (  903)    (  903)    (  903)    (  903)    (    0)
            P= .000    P= .000    P= .000    P= .000    P= .000    P= .

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

```
- - - -  P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S  -

                NEWST      GRADST      LOCAT1      LOCAT2      LOCAT3    ESTBDATE

BUILD1          .0429     -.3088      -.0143       .1818      -.2414     -.3241
              (  903)    (  903)     (  903)     (  903)     (  903)    (  903)
              P= .099    P= .000     P= .334     P= .000     P= .000    P= .000

BUILD2         -.0429      .3088       .0143      -.1818       .2414      .3241
              (  903)    (  903)     (  903)     (  903)     (  903)    (  903)
              P= .099    P= .000     P= .334     P= .000     P= .000    P= .000

STTOTRAT       -.6460     -.4951      -.5181       .3090       .3992      .4456
              (  903)    (  903)     (  903)     (  903)     (  903)    (  903)
              P= .000    P= .000     P= .000     P= .000     P= .000    P= .000


               BUILD1     BUILD2     STTOTRAT

BUILD1         1.0000    -1.0000      -.0335
              (    0)    (  903)     (  903)
              P= .       P= .000     P= .157

BUILD2        -1.0000     1.0000       .0335
              (  903)    (    0)     (  903)
              P= .000    P= .        P= .157

STTOTRAT       -.0335      .0335      1.0000
              (  903)    (  903)     (    0)
              P= .157    P= .157     P= .

(COEFFICIENT / (CASES) / 1-TAILED SIG)

" . " IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED
```

Appendix P

Frequencies and Means for Selected Variables that Did not Appear in the Regression.

Table 43

Frequencies of Students by Their Responses in Considering Science Teaching as A Career.

Responses	No. of Students	%
Yes	482	52.9
No	430	47.1
Total	912	100.00

Table 44

Average CAST Scores for 17 Schools *

Highest School Mean	31.29
Lowest School Mean	22.33
Average Mean of 17 School	26.33

* Highest Possible Score = 50

Table 45

Average SCACL Scores for 53 Science Teachers*

Maximum Scores	51
Minimum Scores	28
Average of all Teachers	41.06

* Highest Possible Scores = 60

Table 46

Frequencies and Means of Teacher's Opinion of Science Teaching Problems

Category	Responses				
	1	2	3	Mean	S.D.
Lack of Inservice Training	8	29	16	2.15	.66
Inadequate Facility	11	22	20	2.17	.75
Lack of Sci. Equip. & Supplies	20	13	20	2.00	.88
Lack ot Teacher Planning Time	17	16	20	2.06	.84
Teachers Are not Prepared to Teach	15	25	13	1.96	.73
Lack of Laboratory Assistant	19	24	10	1.98	.71

3 = serious problem
2 = some what of a problem
1 = not significant problem

BIBLIOGRAPHY

Aiello-Nicosia, M. L. & Others. (1984). The relationship between science process abilities of teachers and science achievement of students: An experimental study. Journal of Research in Science Teaching. 21, 853-858.

Alani, N. M. (1979). The relationships among students' socio-economic background, teacher academic background, sex differences, and their academic achievement in science education at six grade level in Baghdad (Doctoral dissertation, Michigan State University, 1978). Dissertation Abstract International, 39, 7230A.

Al-Eshikh, H. (1972). History of educational movement in the Kingdom of Saudi Arabia. Kafelat Azzait, 20, 3-9. (in Arabic).

Al-Mazroe, H. M. (1982). A comparison between Piagetian cognitive level and physics achievement for twelfth grade students in Saudi Arabia (Doctoral dissertation, University of Northern Colorado, 1982). Dissertation Abstract International, 43, 192A.

Al-Mazyed, M. I. (1976). Science education in public secondary schools in Saudi Arabia as perceived by science teachers and science students (Doctoral dissertation, University of Oregon, 1975). Dissertation Abstract International, 36, 4337A.

Al-Zameli, A. J. (1985). The relationship between teachers' evaluation and students' academic achievement in the sixth grade of Iraqi elementary schools (Doctoral dissertation, University of Pittsburgh). Dissertation Abstract International, 47, 05A.

Anderson, R. I. & others (1982). Science meta-analysis project: Vol. II. Final report. Colorado University, Boulder. (ERIC Document Reproduction Service No. ED 223 476)

Avalos, B. (1980). Teacher effectiveness research in the Third World. High light of a review. Comparative Education, 16, 45-54.

Becher, R. M. (1984). Parent involvement: A review of research and principles of successful practice. ERIC Clearing House on Elementary and Early Childhood Education, Urban, Ill. ERIC Document Reproduction Service No. ED 247 032)

Beebout, H. (1972). The production surface for academic achievement: An economic study of Malaysian secondary education (Doctoral dissertation, University of Wisconson, 1972). Dissertation Abstract International, 33, 07A.

Belz, H. F., Geary, D. C. (1984). Father's occupation and social background: Relation to SAT score. American Research Journal, 21, 473-478.

Berkheimer, G. D. & others. (1982). NSTA position statement, science - technology - society: Science education for the 1980's.

Blamick, W. E. (1984) Secondary science program evaluation report of results. Orange county public schools, Orlano, FL. (ERIC document Reproduction Service No. ED 257 851).

Blosser, P. E. (1984). What research says: Achievement in Science. School Science and Mathematics, 84, 514-521.

Boulanger, F. D. (1980). Instruction and science learning: A quantitative synthesis. In Walberg, H. J. et al., A meta-analysis of productive factors in science learning grade 6 through 12 pp. F1-F42. University of Illinois at Chicago circle, Chicago, Illinois.

Bourke, S. (1986). How relationships between class size, teaching practice, and student achievement. American Educational Research Journal, 23, 558-571.

Branscomb, A. W. (1981). Knowing how to know. Science, Technology, and Human Value, 6, 5-9.

Brimer, A., Madaus, G. F., Chapman, B., Kellaghan, T., & Wood, R. (1978). Source of differences in school achievement. Slough, Bucks, England: NFER.

Brookover, W. B., Beady, C., Flood, P., Schweitzer, J., & Wisenbaker, J. (1979). School social system and students achievements: School can make a difference. New York: Praeger.

Brophy, J. (1986). Teacher influences on student achievement. American Psychologist, 41, 1069-1077

Brown, W. R. (1972). Teacher competencies and characteristics in a science preservice teacher education project. Unpublished Doctoral dissertation, The Ohio State University. Dissertation Abstract International, 33, 02A.

Bryant, F. B. (1987). Component of successful magnet school. (ERIC Document Reproduction Service No. 284 947).

Burstein, L., Fischer, K., & Miller, M. (1980). The multilevel effects of background on science achievement: A cross-national comparison. Sociology of Education, 53, 215-225.

Coleman, J. S., Hoffer, T., and Kilfore, S. (1982). "High school achievements: Public, Catholic, and Private Schools Compared. New York : Basic Books.

Conti, G. J. (1985). Teaching style and learner achievement: The anglo connection. Dialogue of issues of lifelong learning in a Democratic society. Working papers from a British and North American faculty exchange. (ERIC Document Reproduction Service No. 260 212).

Cox, D. C. (1982). The effect of type of classroom science, grade level, years without science instruction, and elective science courses on performance level for selected high school science process skill competencies (Doctoral dissertation, The Ohio State University, 1982). Dissertation Abstract International, 43, 08A.

Cronbach , L. J. (1970). Essential of Psychological Testing, (3rd ed) . New York. Harper & Row.

Crow, C. & Haws, S. (1985). The effect of teaching logical reasoning upon students' critical thinking and science achievement. Paper presented at the annual meeting of the National Association for Research in Science Teaching. French Lick Springs, IN.

CTB/McGraw-Hill. (1977). California achievement test: Examiner's Manual Levels 14 - 19, Form C and D.

Dossey, J. A. (1985). Student classroom results from the Second International Mathematics Study from U.S. twelveth grade classrooms. Paper presented at the annual meeting of the American Educational Research Association, Chicago, ILL.

Druva, C. A. (1983). Science teacher characteristics by teacher behavior and student outcomes: Analysis of research. Journal of Research in Science Teaching. 20, 467-479.

Dunn, R. & Dunn, K. (1979). Learning style/teaching style: Should they... can they... be matched. Educational Leadership, 36, 238-244.

Dunn, R. (1984). Learning style: State of the science Theory into Practice, 23, 10-19.

Dunn, R. & Bruno, A. (1986). Dealing with learning style: Concrete ideas that accommodate the research. Education Digest, 51, 43.

Educational Research Service (1978). Class size: A summary of research. Arlington, VA. Educational Research Service.

EPIE Institute, (1987). Curriculum alignment service for educators: A capablity of the integrated Instructional Information Resources. Water Mill, New York.

Evertson, C., Hawley, W., & Elotnik, M. (1984). The characteristics of effective teacher preparation program: A review of research. Peabody College, Vanderbilt University.

Fagon, M. & Ponder, P. (1981). Measuring teacher effect on student performance. Alberta Journal of Educational Research. 27, 46-56.

Farrell, J. P., & Heyneman, S., & Sepulveda, M. (1978). Textbooks and achievement: What we know. World Bank Staff working paper number 298. Washington D. C., The World Bank.

Fedigan, L. & Gary, G. (1978). School-based elements related to achievement and elements related to student success in schooling and education: Executive summary. Two reviews of the literature Commissiond by the Ministers Advisory Committee on Student achievement. Alberta, Dept. of Education. Edmonton, Planning and Research branch. (ERIC Document Reproduction Service No. 181 042).

Fedigan, L. (1979). School-based elements: A review of the literature. Alberta Dept.. of Education, Edmonton, Minister Advisory committee on Student achievement. (ERIC Reproduction Service No. ED 181 043).

Fehrmann, P., Keith, T., & Reimers, T. (1987). Home influence on school learning: Direct and indirect effects of parental involvement on high school grades. Journal of Educational Research, 80, 330-337

Fields, S. (1985). Can abstract concept be taught to all students. Paper presented at the annual meeting of the National Science Teacher Association. Cincinnati, OH. (ERIC Reproduction Service No. ED 256 564).

Fleming, M. C. & Malone, M. R. (1982). The relationships of student characteristics and student performance in science. In Anderson, R. D. et al., Science meta-analysis project: Final report of NSF project, SED 80-12310 pp. 561-638, University of Colorado, Boulder, Colorado 80309

Fotheringham, J. B., & Creal, D. (1980). Family socio-economic and educational-emotional characteristics as predictors of school achievement. The Journal of Educational Research, 73, 311-317.

Friend, H. & Wisotsky, M. (1984). How does science and mathematics correlation in a seventh grade physics unit affect selected seventh grade students' attitudes toward and achievement in science? In Blosser, P. E. & Helgeson, S. L. (Eds.). Abstract of presented papers, National Association for Research in Science Teaching-57th annual NARST conference, New Orleans, Louisiana.

Fuller, B. (1987). What a school factors raise achievement in the third world? Review of Educational Research, 57, 255-292

Fuller, W., & Chantavanich, A. (1976). A study of primary schooling in Thailand: Factors affecting scholastic achievement of primary school pupils. Bangkok: Office of the National Education Commision.

Gage, N. (1978). The scientific bases of the art of teaching. New York: Teacher College press.

Galitsis, A. (1986).. An analysis of factors used to predict success in the New York regents biology course. In Blosser, P. E. & Helgeson, S. L. (Eds.). Abstract of presented papers National Association for Research in Science Teaching-57th annual NARST conference, San Francisco, California.

Glass, G. V., & Smith, M. L. (1978). Meta-Analysis on Research on the relationship of class-size and achievement. The class size and Instruction Project. Far East Laboratory for Educational Research and Developments, San Francisco, CA.. (ERIC Document Reproduction Service No. ED 168 129).

Glass, G. V., & Smith, M. L. (1980). Meta-Analysis of research on class size and its relationship to attitude and instruction. American Educational Research Journal, 17, 419-433

Good, T. L., & Brophy, J. E. (1986) School effects. In Witterock, M. C. Handbook of Research in Teaching (3rd edition)

Good, T. L., & Weinstein, R. S. (1986). Schools make a difference: Evidence, Criticism, and new directions. American Psychologist, 41, 1090-1097.

Green, C. E., and Szabo, M. (1978). "Effects of reduced reading level on achievement in SCIS.", . Science Education, 63, (1), 37-44.

Harnisch, D. L. (1985). An investigation of the factors associated with the effective public high school. Paper presented at the annual meeting of The Midwestern Educational Research Association, Chicago, Ill.

Haron, I., (1977). Social class and educational achievement in a plural society: Peninsular Malaysia. Doctoral Dissertation, University of Chicago. Dissertation Abstract International, 38, 12A.

Harpole, S. H. (1987). The relationship of gender and learning style to achievement and laboratory skills in secondary school chemistry students. Paper presented at the annual meeting of the Mid-South Educational Research Association, Mobile, AL.

Harty, H., & Al-Faleh, N. (1983). Saudi Arabian students' chemistry achievement and science attitudes stemming from lecture-demonstration and small group teaching methods. Journal of Research in Science Teaching, 20, 861-866.

Harty, H., Beall, D., & Scharmann, L. (1985). Relationships between elementary school students' science achievement and their attitude toward science science, interest in science, reactive curiosity, and scholastic aptitude. School Science and Mathematics, 85, 472-479.

Hasan, O. E. (1975). An investigation into factors affecting science interest of secondary school students. Journal of Research in Science Teaching, 12, 255-261.

Hayes, C., & Kamorman, S. (1983). National academy of sciences-- National research council, Washington, D. C. Panel on work, family, and community. ERIC Document Reproduction Service No.

ED 231 727)

Heyneman, S., & Jamison, D. (1980). Student learning in Uganda: textbooks availability and other factors. Comparative Education Review, 24, 206-220

Heyneman, S., & Loxley, W. (1983). The effect of primary school quality on academic achievement across twenty-nine high and low income countries. American Journal of Sociology. 88, 1162-1194.

Hurd, P. D. (1970). Scientific enlightenment for an age of science. The Science Teacher, 37, 13-15.

International Association for the Evaluation of Educational Achievement, (1988). Science achievement in seventeen countries, a preliminary report.

Jacobson, W. J., & Doran, R. L. (1986). What do our ninth graders think of science and school. The Science Teacher, 53, 59-61.

Johnstone, J. N., & Jiyono. (1983). Out-of-school factors and educational achievement in Indonesia. Comparative Education Review, 27, 278-295.

Kahl, S. R., & others (1982). Sex related differences in pre-college science: Findings of the Science Meta-Analysis Project. ED 216 909.

Keeves, J. P. (1975). The home, the school, and achievement in mathematics and science. Science Education, 59, 439-460.

Khouj, A. M. (1982). A study of the relationship of student test scores on math. and science subjects with their scores on other subjects in a sub-urban school of Jeddah, Saudi Arabia: Occational research study. College of Education, Umm Al-Qura University, Makkah Almukarramah, Saudi Arabia. ERIC Document Reproduction Service No. ED 224 688.

Klein, C. A. (1971). Differences in science concepts held by children from three social-economic levels. School Science and Mathematics, 71, 550-558

Klitgaard, R. E., & Hall, G. R. (1974). Are there unusually effective schools? Journal of Human Resources, 74, 90-106.

Komoski, K. P., (1987). Educational Technology; the closing-in or the opening-out of curriculum and instruction. An information analysis product 1987, ERIC Clearinghouse on Information Resources, Syracuse University, Syracuse, New York.

Kremer, B. K. & Walberg, H. J. (1981). A synthesis of social and psychological influences on science learning. Science Education, 65, 11-23.

Lavin, D. E. (1965). The prediction of academic performance: A theortical analysis and review of research. New York: Russell Sage Foundation.

Lawson, A. E. (1983). Predicting science achievement: The role of developmental level, desembeding ability, mental capacity, prior knowledge, and beliefs. Journal of Research in Science Teaching. 20, 117-129.

Lee, Tien-Ying. (1987). The relationships of achievement, instruction, and family background to elementary school science achievement in the Republic of China. Doctoral Dissertation, The Ohio State University. Dissertation Abstract International, 48, 05A.

Lewis, J. C. (1986). The relationship of school background factors to school building and school district achievement. Paper presented at the the annual meeting of The American Educational Research association. (ERIC Document Reproduction Service No. ED 270 469).

Lott, G. W. (1983). The effect of inquiry teaching and advance organizers upon student outcomes in science education. Journal of Research in Science Teaching, 20, 437-451.

Maqsud, M. (1983). Relationships of locus of control to self-esteem, academic achievement, and prediction of performance among Nigerian secondary school pupils. British Journal of Educational Psychology, 53, 215-221.

Martin, W. H. (1979). *Students' achievement in rural schools: A view from the National Assessment data*. Paper presented at the rural education seminar. College Park, Mayraland. (ERIC Document Reproduction Service No. ED 172 980)

McDonald, F. J., & Elias, P. E. (1976). *Excutive summary report: Beginning teacher evaluation study. Phase II*. Princeton, N. J. Educational Testing Service.

McNamara, K. J., & Deaton, B. J. (1988). *Investment in Education as a rural development strategy. Do increase inputs have an impact*. Paper presented at the annual meeting of the Southern Association of Agricultural Scientist. New Orleans, LA. (ERIC Document Reproduction Service No. ED 295 762).

Mendez, A. , & Ramos, G. (1987). *Attendance at basic sciences lectures: A student perspective.* Research report. (ERIC Document Reproduction Service No. ED 288 441).

Micik, J. M. (1986). Science achievement in American school: A case study. (Doctoral dissertation, Columbia University Teacher College). *Dissertation Abstract International*, *47*, 06A.

Miller, J., & Ellsworth, R. (1985). The evaluation of two-year program to improve teacher effectiveness in reading instruction. *The Elementary School Journal*, *85*, 485-495

Ministry of Education. (1970). *The educational policy in the Saudi Arabian Kingdom*.

Ministry of Education. (1984). *Summary of statistics in education*. Saudi Arabia: Center for Statistical Data and Educational Documentation.

Ministry of Education. (1988). *The statistical memorandom for 1988.* Saudi Arabia: Center for Statistical Data and Educational Documentation.

Ministry of Planning. (1980). *Third development plan* Saudi Arabia: Ministry of Planning, Riyadh.

Ministry of Planning. (1984). Achievement of developmental plans (1970-1983): Facts and figures Saudi Arabia: Ministry of Planning Press.

Mostafa, N. S. (1985). Cognitive development, spatial ability, and achievement in science among Saudi Arabian students (sex, grade, activities). (Doctoral dissertation, University of Michigan). Dissertation Abstract International, 46, 07A.

Mwamwenda, T. & Mwamwenda, B. (1987). School facilities and pupils' academic achievement. Comparative Education, 23, 225-235.

National Assessment of Educational Progress. (1971). 1960-70 science: Group and balanced group results for color, parental education, size and type of community, an balanced group results for region of the country and sex (National Assessment Report 7). National Assessment for Educational Progress, Ann Arbor, Michigan. (ERIC Document Reproduction Service No. ED 067 220)

National Assessment of Educational Progress. (1973). Science: Grouped and balanced group results for color, parental education, size and type of community, and balanced group results for region of the country and sex (report 7). ED 081 638

National Assessment of Educational Progress. (1977). Science: Technical report: summary volume (1977). Educational Commission of the States, Denver, Colorado, National Assessment of Educational Progress. (ERIC Document Reproduction service No. ED 141 135)

Nyrop, R. F., & others (1976). Saudi Arabia: A country Study. Foreign Area Studies, The American University.

Oliver, E. E. (1987) Saudi Arabia. A study of the educational system of Saudi Arabia and a guide to the academic placement of students in educational institutions of the United States. American Association of Collegiate Registrars and Admission Officers, Washington, D. C. (ERIC Documentation Reproduction Service No. ED 285 471)

Purkey, S. C. & Smith, M. S. (1983). Effective schools: A review. Elementary School Journal, 83, 427-452.

Rosier, M. J. (1987). The Second International Science Study. Comparative Education Review, 31, 106-128.

Rutter, M., Maughan B., Mortimore P., Ouston J., & Smith A. (1979). Fifteen thousand hours: Secondary schools and their effects on children. Cambridge, MA: Harvard University Press.

Sagness, R. (1970). A study of selected outcomes of a science pre-service teacher education project emphasizing early involvement of schools of contrasting environmental settings. Doctoral Dissertation, The Ohio State University, 1970. Dissertation Abstract International, 31, 09A

Saha, L. (1983). Social structure and teacher effects on academic achievement: A comparative analysis. Comparative Education Review, 27, 69-88.

Sanguinetty, J. A. (1983). Academic achievement, school quality, and family background: Study in seven Latin American Countries. World Bank, Washington, D. C. (ERIC Document Reproduction Service No. ED 233 448)

Saudi Arabian Monetary Agency. (1984). Education and health, annual report. Department of Statistics, Saudi Arabia, PP 110 - 113.

Schibeci, R. A. & Riley, J. P. (1986). Influence of students' background and perceptions on science attitudes and achievement. Journal of Research in Science Teaching, 23 (3), pp. 177-187.

Schiefelbein, E., & others. (1983). The influence of school resource in Chile. Their effect on educational achievement and occupational attainment. World bank staff working papers number 530.

Seyfarth, J. J. (1988). Effect of change in teacher-pupil ratio and teachers' salaries on achievement and dropouts. Paper presented at the annual meeting of the American Educational Research

Association. New Orleans, LA. (ERIC Document Reproduction Service No. ED 296 970)

Shymansky, J. (1984). BSCS Programs: Just how effective were they? *The American Biology Teacher*, *46*, 55-57.

Simpson, D. R. & Anderson, N. D. (1981). *Science, students, and schools: A guide for the middle and secondary school teacher.* Macmillan Publishing Company: New York.

Smith, L. R. (1977). Aspects of teacher discourse and student achievement in mathematics. *Journal of Research in Mathematics Education*, *8*, 195-204.

Smith, L. & Bramblett, G. H. (1981). The effect of teacher vagueness on student performance in high school biology. *Journal of Research in Science Teaching*, *18*, 353-360.

SPSSx User's Guide (1988). 3rd edition, Chicago: SPSS^x Inc.

Staver, J. R. and Walberg, H. J.(1986). "An Analysis of factors that affect public and private school science achievement." *Journal of Research in Science Teaching,* 23, (2), 97-112.

Steller, A. W. (1988). *Effective schools research: Practice and promise*. Phi Delta Kappa Educational Foundation. Bloomington, Indiana

Stemnock, S. K. (1974). *Summary of research on size of schools and school districts*. Arlington, Va: Educational Research Service, Inc.

Summers, A. A. & Wolfe, B. L. (1975). *Which school resources help learning? efficiency and equity in Philadelphia public schools*. (ERIC Documentation Reproduction Service NO. ED 006 837)

Tate, R. and Burkman, E. (1983). "Interactive effects of sources of direction , Allocated Time, reading ability, and study orientation on achievement on high school science." *Science Education,* 67, (4), 509-522.

Thorndike, R. L. (1973). The relation of school achievements to differences in background of children. Paper presented at conference on educational achievement, Harvard University, Cambridge, Mass.. (ERIC Document Reproduction Service No. 008 981)

Tobin, K. G. (1980). The effect of an extended wait-time on science achievement. Journal of Research in science Teaching, 17, 468-475.

Tobin, K. G., & Capie, W. (1982). Relationships between classroom process variables and middle-school science achievement. Journal of Educational Psychology, 74, 441-454.

Troisi, N., (1983). Effective teaching and student achievement. Reston, Va.: National Association of Secondary School Principals.

Valencia, R., Henderson, R., Rankin, R. (1981). relationship of family constellation and schooling to intellectual performance of Mexican American children. Journal of Educational Psychology, 73, 524-532.

Valencia, R., Henderson, R., & Rankin, R. (1985). Family status, family constellation, and home environmental variables as predictors of cognitive performance of Mexican American children. Journal of Educational Psychology, 77, 323-331.

Wakefield, J. F. (1988). Cognitive skills and vocational interest of intermediate Adolescents. Paper presented at the annual meeting of the American Educational Research Association. New Orleans, LA. (ERIC Document Reproduction Service No. ED 292 989).

Walberg, H. J. (1981). A psychological theory of educational productivity. In F. H. Farely & N. J. Gordon (Ed.), Psychology and education: The state of the union, (pp. 81-114). Berkeley, CA: McCutchan.

Walberg, H. (1986). Syntheses of research on teaching. In Wittrock, M. C. (ed.), *Handbook of research on teaching* (3rd ed.) New York: Macmillan Publishing Company.

Walker, D. A. (1976). *The IEA six subject survey: An empirical study of education in twenty-one countries*. International Studies in Evaluation IX. New York: John Wiley & Sons.

Weiner, B. (1974). *Achievement motivation and attribution theory*. New Jersey: general learning corporation.

Welborn, R. B., & Conti, G. J., (1986). *The influence of learning style and teaching style on achievement among non-traditional health professional students*. In Landers, K. (1986) Enhancing at the crossroad... research and practice. Program and procedings for the annual Adult Education Research Conference. Syracuse, New York, N. Y.

Welch , W. W. (1985). Research in science education: Review and recommendations. *Science education*, *69*, 421-448.

Welch, W. W., Walberg, H. J., & Fraser, B. (1986). Predicting elementary science learning using national assessment data. *Journal of Research in Science Teaching*, *23*, 699-706.

West, E. G. (1983). *Are American school working? Distributing cost and quality trends. Policy analysis no. 26.* Cato Inst., Washington, D.C. ERIC Document Reproduction Service No. ED 235 885.

Williams, D. I. (1968). Rewritten science materials and reading comprehension. *Journal of Educational Research*, *61*, 204-206.

Wilson, A. B. (1969). *The Consequences of segregation: Academic achievement in northern communities*. Berkeley: University of California Press.

Wise, K. C. and Okey, J. R. (1983). A meta analysis of the effect of Various science science teaching strategies on achievement. Journal of Research in Science Teaching. 20, 419-435.

White, K. R. (1976). The relationship between socio-economic status and academic achievement. Doctoral Dissertation, University of Colorado, Boulder. Dissertation Abstract International, 37, 08A.

White, K. R. (1982). The relationship between socio-economic status and academic achievement. Psychological Bulletin, 91, 461-481.

Wright, C. J., & Nuthall, G. (1970). Relationship between teacher behavior and pupil achievement in three experimental elementary science lessons. American Educational Research Journal, 7, 477-491.

Zeitoun, H. H. (1988). The relationship between abstract achievement and prior knowledge, formal reasoning, an sex among Egyptian secondary school student. In Blosser, et al. (1988). Abstract of presented papers. National Association for Research in Science Teaching. 61st annual NARST conference, St. Louis, Missouri.